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OF THE

AMERICAN GEOGRAPHICAL SOCIETY

OF

NEW YORK.

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VOL. VIII.

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1878.

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No. 65.

IN SENATE,

April 27, 1877.

ANNUAL REPORT

OF THE

AMERICAN GEOGRAPHICAL SOCIETY FOR THE YEAR 1876.

AMERICAN GEOGRAPHICAL SOCIETY,
No. 11 WEST 29TH STREET, NEW YORK, *April* 17, 1877.

Hon. WILLIAM DORSHEIMER,
President of the Senate of the State of New York:

SIR. — In conformity with the provisions of the act incorporating this Society, I have the honor to transmit herewith the annual report of the American Geographical Society for the year 1876.

Very respectfully yours.

CHARLES P. DALY,
President.

AMERICAN GEOGRAPHICAL SOCIETY.

COUNCIL, 1876.

OFFICERS:

PRESIDENT,

CHARLES P. DALY.

VICE-PRESIDENTS,

FREDERICK A. CONKLING, FRANCIS A. STOUT,
GEORGE W. CULLUM.

FOREIGN CORRESPONDING SECRETARY,

CHARLES A. JOY.

DOMESTIC CORRESPONDING SECRETARY,

JAMES MÜHLENBERG BAILEY,

RECORDING SECRETARY,

ELIAL F. HALL.

TREASURER,

GEORGE CABOT WARD.

COUNCILORS,

WILLIAM REMSEN,
THEODORE W. DWIGHT,
T. BAILEY MYERS,
W. H. H. MOORE.
WILLIAM E. CURTIS,
WALTON W. EVANS,
ISAAC BERNHEIMER,
H. MANIGAULT MORRIS,
HARLOW M. HOYT,
ROSWELL D. HITCHCOCK,
S. L. M. BARLOW,
ISAAC I. HAYES,
PAUL B. DU CHAILLU,
WILLIAM H. MORRELL,
CLARENCE KING.

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ANNUAL REPORT

OF THE

AMERICAN GEOGRAPHICAL SOCIETY.

To the Honorable the Legislature of the State of New York:

In presenting the Annual Report of this Society, as required by the act of April 8, 1871, we beg to say that the charter, amended charter, organization and general business, embracing a complete history of the Society's operations during 1876, will be found in the following pages.

CHAS. P. DALY,
President.

ELIAL F. HALL,
Recording Secretary.

CHARTER OF INCORPORATION.

GRANTED APRIL 13TH, 1854.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. George Bancroft, Henry Grinnell, Francis L. Hawks, John C. Zimmerman, Archibald Russell, Joshua Leavitt, William C. H. Waddell, Ridley Watts, S. DeWitt Bloodgood, M. Dudley Bean, Hiram Barney, Alexander J. Cotheal, Luther B. Wyman, John Jay, J. Calvin Smith, Henry V. Poor, Cambridge Livingston, Edmund Blunt, Alexander W. Bradford, and their associates, who are now or may become hereafter associated for the purposes of this act, are hereby constituted a body corporate by the name of the American Geographical and Statistical Society, for the purpose of collecting and diffusing geographical and statistical information.

§ 2. For the purposes aforesaid, the said Society shall possess the general powers and privileges, and be subject to the general liabilities contained in the third title of the eighteenth chapter of the first part of the Revised Statutes, so far as the same may be applicable, and may not have been modified or repealed; but the real and personal estate which the said Society shall be authorized to take, hold and convey, over and above its library and maps, charts, instruments and collections, shall not at any time exceed an amount the clear yearly income of which shall be ten thousand dollars.

§ 3. The officers of the said Society shall be a president, three vice-presidents, a corresponding secretary, a recording secretary, a librarian, and treasurer, and such other officers as may from time to time be provided for by the by-laws of the said Society.

§ 4. The said Society, for fixing the terms of admission of its members, for the government of the same, for changing and altering the officers above named, and for the general regulation and management of its transactions and affairs, shall have power to form a code of by-laws not inconsistent with the laws of this State or of the United States; which code, when formed and adopted at a regular meeting,

shall, until modified or rescinded, be equally binding as this act upon the said Society, its officers and its members.

§ 5. The Legislature may at any time alter or repeal this act.

§ 6. This act to take effect immediately.

STATE OF NEW YORK,
Secretary's Office.

I have compared the preceding with the original law on file in this office, and hereby certify the same to be a correct transcript therefrom and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this thirteenth [L. S.] day of April, one thousand eight hundred and fifty-four.

A. G. JOHNSTON,
Deputy Secretary of State.

AMENDED CHARTER.

PASSED APRIL 8TH, 1871.

STATE OF NEW YORK, No. 237, IN SENATE, *March* 7, 1871.— Introduced with unanimous consent by Mr. Bradley; read twice and referred to the Committee on Literature; reported favorably from said committee, and committed to the Committee of the Whole.

CHAP. 373.

AN ACT in relation to The American Geographical and Statistical Society.

PASSED April 8th, 1871.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The name or corporate title of the said Society shall hereafter be, "The American Geographical Society of New York."

§ 2. The objects of the said Society shall be the advancement of geographical science; the collection, classification and scientific arrangement of statistics, and their results; the encouragement of explorations for the more thorough knowledge of all parts of the North American continent, and of other parts of the world which may be imperfectly known; the collection and diffusion of geographical, statistical and scientific knowledge by lectures, printed publications or other means; the keeping up of a correspondence with scientific and learned societies in every part of the world, for the collection and diffusion of information, and the interchange of books, charts, maps, public reports, documents and valuable publications; the permanent establishment in the city of New York of an institution in which shall be collected, classified and arranged, geographical and scientific works, voyages and travels, maps, charts, globes, instruments, documents, manuscripts, prints, engravings, or whatever else may be useful or necessary for supplying full, accurate and reliable information in respect to every part of the globe, or explanatory of its geography, physical and descriptive; and its geological history, giving its climatology, its productions, animal, vegetable and mineral;

its exploration, navigation and commerce; having especial reference to that kind of information which should be collected, preserved, and be at all times accessible for public uses in a great maritime and commercial city.

§ 3. The power given by the act hereby accorded to the said Society, to take, hold, convey, manage and make use of its real and personal estate, shall be understood as authorizing said Society to take and hold by gift, grant, bequest, devise, subject to all provisions of law relative to devises and bequests by last will and testament, or purchase real estate to the value of three hundred thousand dollars, and to invest its income, or its personal estate generally, so as to produce a regular annual income sufficient for the accomplishment of the purposes set forth in the first section of this act; but said annual income shall not exceed twenty-five thousand dollars annually.

§ 4. The said Society shall make an annual report of its proceedings to the Legislature.

STATE OF NEW YORK, *Office of Secretary of State,* } ss.:

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this twenty-second day of May in the year one thousand eight hundred and seventy-one.

[L. S.]

DIEDRICH WILLERS, JR.,
Deputy Secretary of State.

BY-LAWS.

CHAPTER I.

TITLE.

The title of the Society is, "The American Geographical Society."

CHAPTER II.

OBJECTS.

The objects of the Society are, "The collecting and diffusing of geographical and statistical information."

CHAPTER III.

MEMBERS.

1. The Society shall consist of fellows, honorary, corresponding and *ex-officio* members.

2. Honorary members shall be chosen on account of their distinction in the science of geography or statistics, and not more than twelve of them shall hereafter be elected in any one year.

3. Corresponding members shall be chosen from those who have aided the advancement of geography or statistics.

4. *Ex-officio* members shall be foreign diplomatic representatives and consuls resident in the United States, and United States diplomatic representatives and consuls in foreign countries.

5. Fellows, and corresponding and honorary members shall be elected as follows: All nominations of candidates shall be openly made in writing at a meeting of the Society or the Council by a member thereof, and, together with the name of the member making them, entered on the minutes. The persons thus nominated, when approved by the Council and elected by the Society, shall, on payment of the initiation fee, if nominated as fellows, and without such payment, if nominated as corresponding or honorary members, become members of the Society accordingly.

6. Persons entitled to become *ex-officio* members of the Society shall, on the recommendation of the Council, be, by the Society, constituted and declared to be such members.

7. The name of any member of the Society may, on the recommendation of the Council, and by a vote of two-thirds of the members present at a stated meeting of the Society, be dropped from the roll of its members.

CHAPTER IV.

INITIATION FEE AND ANNUAL DUES.

1. The initiation fee, including the dues for the current year, shall be, for a Fellow, ten dollars to be paid immediately on election.

2. The annual dues thereafter shall be, for a Fellow, ten dollars to be paid in advance.

3. Any Fellow of the Society not in arrears may commute for life all dues for fellowship by the payment at one time, if a Fellow, of $100.

4. The name of any Fellow of the Society neglecting for two successive years to pay his annual dues, or at any time wholly refusing to pay them, may, by the Council, be erased from the list of Fellows of the Society.

5. The fiscal year of the Society shall, for all purposes, be the calendar year, that is, commence on the first day of January and end with the thirty-first day of December in each year.

CHAPTER V.

OFFICERS.

1. The officers of the Society shall be a president, three vice-presidents, a foreign corresponding secretary, a domestic corresponding secretary, a recording secretary, a treasurer and fifteen councilors; and these officers together shall form the Council of the Society.

2. The officers and members of Council elected at the next annual election (except the president and treasurer) shall, at their first meeting, divide themselves into three classes, each to embrace one vice-president, one secretary, and five members of the Council, one of which classes shall hold office one year, one for two years, and another for three years, to be determined at said meeting by lot, or otherwise. The president and treasurer shall always be elected annually, and at each annual election thereafter there shall be elected a vice-president, secretary and five members of Council, each for the term of three years.

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CHAPTER VI.

ANNUAL MEETING.

1. The annual meeting of the Society shall be held on the second Tuesday after the first day of January in each and every year hereafter, when the annual election of the officers of the Society shall take place; and if, from any cause, there shall be a failure of the annual election at the time above designated for that purpose, the same may be held on the Tuesday next following, that is, on the third Tuesday after the first day of January in each year, and of which due notice shall be given.

2. Every member of the Society, who has been such for twenty days or more, and who is not in arrears for his dues for the past year, shall be entitled to vote at the said election.

3. At the annual meeting of the Society, the Council shall present a general report of its proceedings, and of those of the Society during the past year; and the secretaries and treasurer shall also present their annual reports.

CHAPTER VII.

MONTHLY AND SPECIAL MEETINGS.

1. The Society, unless otherwise specially ordered by the Society or the Council, shall hold its stated meetings for the transaction of business on the second Tuesday of each month of the year, except July, August and September.

2. The president, or, in his absence, one of the vice-presidents, may, and upon the written request of five members, shall call a special meeting of the Society, by giving three days' notice thereof in two daily newspapers published in the city of New York.

CHAPTER VIII.

ORDER OF BUSINESS.

1. At all stated meetings of the Society, for the transaction of ordinary business, the order of proceedings shall be as follows:

1. Reading of the minutes.
2. Reports and communications from officers of the Society.
3. Reports from the Council.
4. Reports from committees.
5. Nominations of members.
6. Special orders.
7. Unfinished business.
8. Miscellaneous business.
9. Papers read and addresses delivered before the Society.

2. All propositions presented for the action of the Society, at any of its meetings, shall be in writing, when requested by the presiding officer or any member. A proposition thus presented, when seconded, and the question thereon stated from the chair, shall be deemed to be in the possession of the Society, and open for discussion; but may be withdrawn by the mover, at any time before amendment or decision.

3. No member shall speak more than once upon the same question until all the other members present, desiring to speak, shall have spoken; nor more than twice on any question without leave of the Society.

CHAPTER IX.

QUORUM.

At all meetings of the Society, nine members present shall constitute a quorum for the transaction of business.

CHAPTER X.

COMMITTEES.

All committees, authorized by the Society, shall, unless otherwise specially ordered, consist of three members each, and be appointed by the presiding officer.

CHAPTER XI.

PRESIDING OFFICER.

At all meetings of the Society, on the arrival of the appointed hour, and the presence of a quorum, the president, or, in his absence, one of the vice-presidents, or, in the absence of both, a chairman *pro tem.*, shall immediately take the chair, call the meeting to order, and preside. He shall have only a casting vote. He shall preserve order and decide all questions of order, subject to an appeal to the Society. He shall also, unless otherwise specially ordered, appoint all committees authorized by the Society; and, at every annual election, before the opening of the polls, he shall appoint two tellers of the election.

CHAPTER XII.

SECRETARIES.

1. Foreign Corresponding Secretary. — It shall be the duty of the foreign corresponding secretary to conduct the general correspondence of the Society with individuals and associate bodies in foreign countries.

2. Domestic Corresponding Secretary. — It shall be the duty of the domestic corresponding secretary to conduct the Society's general correspondence with individuals and associate bodies in the United States.

3. Both the foreign and domestic secretaries shall keep, in suitable books to be provided for that purpose, at the Society's rooms, true copies of all letters written by them respectively on behalf of the Society; and shall preserve on proper files, at the said rooms, all letters received by them on the same account; and at each stated meeting of the Society or the Council they shall respectively report their correspondence and read the same, or such parts thereof as may be required.

4. In case of a vacancy in the office of either of the corresponding secretaries, or in the absence or disability of either of these officers, the duties of both may be performed by the other corresponding secretary.

5. The Society may designate a particular officer, or appoint a committee to prepare a letter or letters on any special occasion.

6. Recording Secretary. — It shall be the duty of the recording secretary to give due notice of the time and place of all meetings of the Society, and to attend the same. He shall keep fair and accurate minutes of the proceedings of the Society, and record the same, when approved, in the Society's Journal. He shall give immediate notice to the several officers and committees of the Society of all votes, orders, resolves and proceedings of the Society, affecting them or appertaining to their respective duties. He shall prepare a list of the members of the Society entitled to vote, to be handed to the tellers before the opening of the polls at each annual election. He shall officially sign and affix the corporate seal of the Society to all diplomas and other instruments or documents authorized by the Society or Council. He shall have charge of the corporate seal, charter, by-laws, records and general archives of the Society, except so far as they may be expressly placed under the charge of others. He shall certify all acts and proceedings of the Society, and shall notify the Council of the death, resignation or removal of any officer or member of the Society. He shall have charge of the rooms of the Society, and shall perform all such other and further duties as may from time to time be devolved upon him by the Society or the Council. He, together with the Council, shall have the charge and arrangement of the books, maps and collections belonging to the Society. He shall cause to be kept in the rooms of the Society a

registry of all donations to the library or collections of the Society, acknowledge their receipt by letter to the donors, and report the same, in writing, to the Society at its next stated meeting.

7. All documents relating to the Society, and under the charge of the secretaries respectively, shall be placed in such depositories in the rooms of the Society as the Council may provide and designate for that purpose.

CHAPTER XIII.

TREASURER.

The treasurer shall have charge of, and safely keep, all contracts, certificates of stock, securities, and muniments of title belonging to the Society. He shall collect the dues and keep the funds of the Society, and disburse the same under the direction of the Council; and so often as the said funds in the hands of the treasurer shall amount to one hundred dollars, he shall deposit the same, in the name of the Society, in some incorporated bank in the city of New York, to be designated for that purpose by the Council; and the said funds, thus deposited, shall be drawn out of the said bank on the check of the treasurer, countersigned by the chairman of the Council, and only for the legitimate and authorized purposes of the Society. The treasurer shall, previous to the annual meeting of the Society, prepare and submit to the Council, for audit, a detailed account of his receipts and disbursements for account of the Society during the past year; and which annual account duly audited, he shall present, with his general report, to the Society, at its annual meeting.

CHAPTER XIV.

COUNCIL.

1. The Council shall have the management and control of the affairs, property, and funds of the Society; and shall designate an incorporated bank in the city of New York, where the said funds shall, from time to time as they accrue, be deposited by the treasurer.

2. It may frame its own by-laws not inconsistent with the charter or by-laws of the Society.

3. It shall appoint the necessary agents, clerks and servants of the Society, with such powers, and duties, privileges, and compensation, as it may, from time to time, determine; and may, at pleasure, revoke such appointments, and make others in their stead.

4. It shall have power to fill, for the unexpired term, any vacancy that may occur in any of the offices of the Society.

5. It shall have power, at its discretion, to declare vacant the seat of any member of its own body (except the president and vice-presidents) who shall have been absent from its meetings for three successive months; and also, by a vote of a majority of the whole Council, to remove, from its own body, any member thereof for cause; but in such case it shall be the duty of the Council to report every such vacancy or removal to the Society, at its next stated meeting thereafter, when such cases shall be subject to review by the Society.

6. It shall not, without an approving vote of the Society, at a stated meeting thereof, make any contract whereby a liability in amount above one thousand dollars may be incurred by the Society; nor, without such vote, make any sale or disposition of the property of the Society, exceeding that sum in value.

7. The Council may, in its discretion, remit the initiation fee, or annual dues, of any member of the Society.

8. No member of the Council shall receive any salary or pecuniary compensation for his services.

9. The Council shall hold stated meetings for the transaction of business, at least once in every month, except the months of July, August and September.

10. At all meetings of the Council, five members present shall constitute a quorum for the transaction of business.

CHAPTER XV.

GENERAL PROVISION AS TO DEBT.

No debt on account of the Society, beyond the funds in the treasury for its payment, shall, for any purpose, at any time, be incurred; and if, at any time, it shall appear that there are resting upon the Society pecuniary obligations beyond the funds in the treasury for their liquidation, no appropriation of funds from the treasury whatever, except for the necessary current expenses of the Society, shall be made until the said pecuniary obligations shall be fully discharged, or the funds necessary for their extinction shall have been set apart for that purpose.

CHAPTER XVI.

ALTERATION OF THE BY-LAWS.

No alteration in the by-laws of the Society shall be made unless openly proposed at a stated meeting of the Society, entered on the minutes, with the name of the member proposing the same, and adopted by the Society at a subsequent stated meeting by a vote of two-thirds of the members present.

CHAPTER XVII.

ADOPTION OF THE BY-LAWS.

The foregoing are hereby adopted and declared to be the by-laws of the Society; and all by-laws of the Society heretofore adopted are hereby rescinded, and declared to be null and void.

HONORARY AND CORRESPONDING MEMBERS, AND FELLOWS.

HONORARY MEMBERS.

Markham, Clements R., C. B., Secretary of the Royal Geographical Society, London, England.

McClintock, Francis Leopold, LL. D., London, England.

Middendorff, Adolph Theodore von, Secretary of the Imperial Academy of Sciences of Russia, St. Petersburg.

Baker, Sir Samuel White, Pasha, F. R. S., London, England.

Baker, Lady, London, England.

His Imperial Highness, the Grand Duke Constantine of Russia, President of the Imperial Geographical Society, St. Petersburg, Russia.

Ismail, H. I. M. Pasha, Khedive of Egypt.

Layard, Austin Henry, D. C. L., London, England.

Petermann, Professor Augustus, Ph. D., Gotha, Germany.

Rawlinson, Sir Henry Creswicke, D. C. L., London, England.

Struve, Otto Wilhelm von, St. Petersburg, Russia.

Wilczek, Count H., Vienna, Austria.

CORRESPONDING MEMBERS.

Abbe, Prof. Cleveland, Cincinnati, Ohio.

Alvord, Gen. Benjamin, U. S. A., Washington, D. C.

Altamirano, Senor Don Ignacio, Mexico.

Ammen, Commodore Daniel, U. S. N.

Baker, Commodore, F. H., U. S. N., Norfolk, Va.

Baranda, Senor Joaquin, Mexico.

Barclay, James T., M. D., Jerusalem, Syria.

Barnard, Henry, LL. D., Hartford, Conn.

Bartlett, Jno. Russell, Providence, R. I.

Bastian, Dr. A., Berlin.

Becker, M. A., Vienna.

Behm, Dr. E., Gotha.

Beebe, C. G., Shanghae, China.

Boudinot, Col. E. C., Vanita, Cherokee Nation.

Braine, Commander D. L., U. S. N.

Bright, John, M. P., London, England.

Bushnell, Rev. Albert, Gaboon, Equatorial Africa.

Carlos, Senor Don Jose, Washington, D. C.

Chaix, Prof. Paul, Geneva, Switzerland.

Cierol, Senor Manuel, Mexico.

Chandless, W., F. R. G. S., London, England.

Collins, Lieut. Fred., U. S. N., Annapolis, Md.

DeHaass, Rev. F. S., U. S. Consul, Jerusalem.

Davis, Thomas E., Rome.

Dow, Capt. J. M., Panama, C. A.

Draper, Lyman, Madison, Wis.

Duncan, William H., Hanover, N. H.

Emory, Gen. Wm. H., U. S. A., Washington, D. C.

Foetterle, Franz, late Secretary of the Imperial Geographical Society of Vienna, Austria.

Fritsch, Hugo O., New York.

Gardner, J. T., Director State Survey, Albany, N. Y.
Gibbs, Douglass, Alexandria, Egypt.
Gilman, Daniel Coit, LL. D., Baltimore, Md.
Guyot, Prof. Arnold Henry, LL. D., Princeton, N. J.
Hague, J. D., Washington, D. C.
Hancock, Wm. Neilson, LL. D., Dublin.
Hayden, Prof. F. V., Washington, D. C.
Hansell, Herr, Khartoum.
Hefte, Thomas J., Consul, Christiania.
Hellwald, Friedrich von, Member of the Imperial Royal Geographical Society, Vienna, Austria.
Hitchcock, C. H., Ph. D., Hanover, N. H.
Hochstetter, Dr. Ferdinand von, Professor in the University of Vienna, Austria.
Hosmer, Dr. Geo. W.
Hough, Franklin B., M. D.
Humphreys, General A. A., U. S. A., Washington, D. C.
Hunt, Prof. T. Sterry, LL. D., Boston.
Jackson, John P., Berlin.
Kirkham, General, Adowa, Abyssinia.
Lapham, I. A., Milwaukee, Wis.
Lamansky, Eugene von, St. Petersburg, Russia.
Lesseps, Ferdinand de, Suez, Egypt.
Long, Stephen H., U. S. A., Louisville, Ky.
Luce, Captain S. B., U. S. N.
Lull, Commander E. P., U. S. N., Newport, R. I.
McCartee, Divie Bethune, M. D., Hong Kong, China.
McLean, Wm. J., Bombay, India.
Malte Brun, V. A., Honorary Secretary of the Geographical Society, Paris, France.
Mariscal, Senor Don Ignacio, Mexico.
Marsh, Hon. George P., LL. D., U. S. Minister, Rome, Italy.
Martin, Rev. Wm. A. P., D. D., Professor in the Imperial College, at Pekin, China.
Maury, Louis Ferdinand Alfred, Paris.
Maunoir, Charles, Paris.
Naprstek, Vojta, Prague, Austria.
Nassau, Rev. R. H., Gaboon, Africa.
Negri, Cristoforo, late President Italian Geographical Society, Consul General of Italy, Hamburg.
Newmarch, Wm., Hon. Sec. of the Statistical Society of London, England.
Nordenskjöld, Prof. A. E., Stockholm.
Palazios, Gen. Vincente, Riva, Mexico.
Pardo, Senor Don Emilio, Mexico.
Pacha, Ismail, Governor General of the Soudan.
Payno, Senor Don Manuel, Mexico.
Perkins, E. H.
Penna, Senor Terreira, Para, Brazil.
Pinheiro, J. C. Fernandes, M. D., Brazil.
Pimentil, D. Joaquin Xavier de Oliveria, Satarem Para, Brazil.
Porsche, Theodore, Washington, D. C.
Rae, John, M. D., Hamilton, Canada.
Raymond, Captain Charles W., U. S. A., West Point, N. Y.
Rio de la Loza, Senor Don Leopoldo, Mexico.
Roberts, Gen. W. M., New York.
Romero, Mathias, Mexico.
Rogers, Rear Admiral John, U. S. N.
Rothrock, Dr. J. T., Wilkesbarre, Pa.
Saint-Martin, Vivien de, Paris.
Sauer, George, Paris.
Sapucachy, M. Le Viscomte, Rio Janeiro, Brazil.
Schade, Louis, M. D., Washington, D. C.
Schlagintweit-Sakünlünnski, Robert von, Giessen, Germany.
Schlagintweit-Sakünlünnski, Hermann von, Munich, Germany.
Schumacher, Dr. H. A., Consul, New York.
Schuyler, Eugene, St. Petersburg, Russia.
Schumacher, John, Altona, Germany.
Selfridge, Com. T. O., U. S. N., Washington, D. C.
Seymour, Horatio, LL. D., Utica, N. Y.
Simmons, D. B., M. D., Yeddo, Japan.
Stanley, Henry M., Ashantee.
Starring, General F. A., Paris.
Stevens, Henry, London, England.
Steere, J. B., U. S. Consul, Hong Kong, China.

TAINTOR, Edward C., Shanghae, China.
TEJADO, Don Sebastian Lerdo de, Mexico.
VAN BENTHUYSEN, Charles, Albany, New York.
WHEELER, Lieut. G. M., U. S. A., Washington, D. C.
WILLIAMS, S. Wells, U. S. Legation, Pekin, China.
WYMAN, Captain R. H., U. S. N., Washington, D. C.

FELLOWS.

L. F. — Life Fellows.

Abbot, James L.
Abbott, Josiah H.
Acker, David D.
Acton, Thomas C.
Adams, Charles Francis.
Adams, John P.
Adams, Russell W.
Adams, William.
Adler, Felix.
Agnew, Alexander McL.
Agnew, John T. (L. F.)
Aikman, Samuel M.
Aitken, William B.
Albert, Halpern.
Alexander, Charles B.
Alexander, Junius B.
Alexander, J. W.
Alexander, Wm.
Allen, Horatio M.
Allen, Henry W.
Allen, Wm. M.
Alliger, Elijah.
Alsop, Joseph W.
Amend, Bernhard G.
Amidon, Francis H.
Amsinck, Gustav.
Amy, Henry.
Anderson, Henry H.
Andrews, George H.
Andrews, Wm. L.
Anthony, Edward.
Anthony, Henry T.
Appleton, William H.
Appleton, John A.
Appleton, D. S.
Appleton, George S.
Appleton, Nathan.
Arnold, Daniel H. (L. F.)
Arnold, Richard.
Arnoux, William H.
Arthur, Chester A.
Asch, Joseph J.
Ascher, Adolph.
Aspinwall, Lloyd.
Astor, W. W.
Atkinson, William H.
Atterbury, W. W.
Auchincloss, Henry B.
Auchmuty, Richard T.
Auferman, August.
Avery, Samuel P.
Aymar, William. (L. F.)

Babcock, O. E.
Backus, Henry C.
Backarach, Herman.
Balch, George T.
Bailey, N. P.
Bailey, James M.
Baker, Peter C.
Baker, James, Jr.
Baker, Francis. (L. F.)
Baldwin, Chas. H.
Baldwin, Townsend B.
Ballin, Eugene S.
Bancroft, George. (L. F.)
Bancroft, Benjamin F.
Banks, David.
Banks, Jas. L.
Banvard, John.
Banyer, Goldsboro.
Barbour, Thomas.
Barbey, A. H.
Bard, Charles.
Barlow, S. L. M.
Barling, Henry A.
Barnard, F. A. P.
Barnard, Horace.
Barney, A. H.
Barney, Hiram. (L. F.)
Barney, Newcomb C.
Barney, Charles T.
Barnes, John S.
Barnes, Wm.
Barrow, John W.
Barril, John J.
Barr, William.
Bartlett, Willard.
Bartow, Morey H.
Bates, Levi M.
Beach, Wm. A.
Beach, Miles.
Beaman, Charles C., Jr.
Beardslee, Rufus G.
Beardslee, J. B.
Beckwith, N. M.
Beckwith, Leonard F.
Beecher, Henry Ward.
Beekman, James W.
Beekman, Gerard.
Beckwith, Leonard F.
Bedle, Joseph D.
Belding, Milo M.
Bell, Isaac.
Bell, George.
Bell, Clark.
Belknap, George E.
Belknap, Robert L.
Belmont, August. (L. F.)
Bellew, F. H. T.
Bellows, Henry W.
Benedict, Erastus C.
Bennett, James Gordon.
Benjamin, John.
Benjamin, E. B.
Benkard, James.
Bent, Silas.

Bergland, Eric.
Bernacki, Chas.
Bernheimer, J. A.
Bernheimer, Adolph.
Bernheimer, Isaac.
Bernheimer, Simon.
Beste, Henry.
Betts, William.
Berry, Richard.
Bickmore, Albert S.
Bien, Julius.
Bierstadt, Albert.
Bigelow, John.
Bill, Edward.
Billings, Fred'k.
Birdseye, Lucien.
Bishop, D. W. (L. F.)
Bishop, T. Alston. (L. F.)
Bissinger, Philip.
Bixby, William H.
Bjerring, Nicholas.
Blake, Charles F.
Bliss, George.
Blood, O. Howard.
Bloomfield, William.
Boardman, Andrew.
Blunt, Geo. W. (L. F.)
Bodisco, Waldemer de.
Body, John E.
Boese, Charles.
Bookstaver, Henry A.
Bonn, William B.
Bonner, Robert.
Bonner, John.
Boorman, J. M.
Booth, William A.
Booth, Robert, R.
Booth, William T.
Botta, Vincenzo.
Bouck, C. W.
Bowne, Richard H.
Bowie, Aug. J., Jr.
Brady, John R.
Bredt, Ernest.
Breese, Jas. L.
Brevoort, J. Carson.
Brewerton, Henry.
Brooks, Sidney.
Brower, John.
Brown, Charles S.
Brown, James. (L. F.)
Brown, James M.
Brown, Stewart.
Brown, Walston H.
Brownson, W. H.
Brown, Vernon H.
Brownell, Silas B.
Bryant, William Cullen.
Bryce, James. (L. F.)
Buechner, August.
Buell, James.
Buckley, James M.
Bulkley, Chas. E.
Bull, Charles S.
Burgess, William J.
Burnett, H. L.
Butler, Benjamin F.
Butler, Charles.
Butler, Cyrus.
Butler, William A.
Butterfield, Daniel.

Cable, George W.
Cabot, Stephen.
Caleb, Madison M.
Cameron, J. G. M.
Cameron, R. W.
Campbell, Allan.
Cannon, S. Townsend.
Carhart, Thomas F.
Carter, James C.
Carter, Oliver S.
Carter, Robert.
Carter, Walter S.
Cary, William F. (L. F.)
Case, Robert L.
Cassebeer, Henry A., Jr.
Caswell, William H.
Catlin, Julius F.
Catlin, N. W. Stuyvesant. (L. F.)
Caylus, Ernest.
Ceballos, J. M.
Chalmers, George.
Champlin, John D., Jr.
Chandler, C. F.
Chapman, Joseph H.
Chase, Leslie.
Chatfield, Cyrus H.
Chatillon, John P.
Chauncey, Frederick.
Chauncey, Henry.
Chickering, Charles F.
Chickering, George H.
Childs, Calvin G.
Chittenden, S. B., Jr.
Choate, William G.
Christern, F. W.
Church, George E.
Church, John A.
Churchill, Franklin H.
Cisco, John J.
Clark, A. Hyatt.
Clark, E. V.
Clark, Lot Curran.
Clark, Luther C.
Clarke, W. H.
Clarke, W. W.
Clendenin, J. W.
Clerke, Wm. B.
Coates, Isaac T.
Cochrane, Henry Clay.
Cockcroft, Jacob H. V.
Cogswell, William L.
Colgate, Bowles.
Colgate, Charles C.
Colgate, James B.
Colgate, Robert.
Colton, Joseph H. (L. F.)
Comstock, Cornelius.
Cone, Jas. B.
Conger, Abraham B.
Conger, Clarence R.
Conklin, Eugene E.
Conklin, William A.
Conkling, Frederick A. (L. F.)
Connery, T. B.
Conover, John T.
Constable, A. G.
Constable, James M.
Constantine, Andrew J.
Constantine, John.
Conyngham, William L.
Cooley, James E. (L. F.)
Cooper, Edward.
Cooper, Peter.
Cooper, George C.
Cornell, John B.
Corning, Erastus.
Cornwall, N. Ellsworth.
Corse, Israel.
Cossitt, Frederick H.
Coster, Charles H.
Cottenet, Francis.
Courtright, Milton.

Coutan, Charles E.
Cowdin, Elliot C.
Cowdrey, N. A.
Cowles, Walter S.
Cox, Samuel S.
Crain, Durham Jones.
Crawford, S. W.
Crerar, John.
Crocker, William Baylies.
Crocker, George A.
Crocker, David.
Crooks, Ramsay.
Crosby, J. Schuyler.
Crosby, Hiram B.
Cruickshank, James.
Cruikshank, Edwin A.
Cushing, Caleb.
Cushman, W. F.
Cullum, George W. (L. F.)
Cullum, Mrs. George W. (L. F.)
Curphey, James.
Curren, Robert.
Curtis, Benj. R.
Curtis, William E.

Daly, Charles P.
Daly, Augustin.
Daly, Joseph F.
Dalrymple, Alexander.
Dana, Charles A.
Dana, William B.
Dancker, Charles.
Dane, H. C.
Daniel, Edwin M.
Darling, William A.
Darrow, William.
Dash, John B.
Davidson, Stratford B.
Davies, Julian T.
Davies, Henry E.
Davison, Charles A.
Davis, Alexander J.
Davis, C. H.
Davis, Gilbert F.
Davis, Noah.
Davis, John H.
Davis, John G.
Davis, Samuel D.
Dawson, B. F.
Dawson, A. H. H.
Day, Murray S.
Dayton, Jesse C.
De Camp, Wm. Scott.
De Castro, Diego.
Defendorf, Wilson.
Decker, Charles A.
Decker, John J.
Delafield, Lewis L.
Delafield, M. L.
Delmonico, L.
Del Monte, Leonardo.
De Lancey, Edward F.
Delano, Franklin H.
Dennis, Charles. (L. F.)
Denny, Thomas, Jr.
De Peyster, Fred'k. (L. F.)
De Peyster, Fred'k J.
De Peyster, J. Watts. (L. F.)
Detmold, Christian E.
Detmold, William.
Devlin, Jeremiah.
Deyo, R. E.
Dickerson, E. N.
Diefendorf, Menzo.
Diggs, D. William.
Dillon, Romaine. (L. F.)
Dinsmore, William B.
Ditson, Oliver.
Dix, John A.
Dodd, Josiah F.
Dodge, Charles C.
Dodge, William E.
Dodge, William E., Jr.
Dommerick, L. F.
Donohue, Charles.
Donnelly, John J.
Douglass, Andrew E.
Dowd, William.
Downer, Samuel.
Draper, Frank E.
Drexel, Jos. W.
Driggs, Marshall S.
Drowne, Henry T.
Duane, Martin H.
Du Bois, William A.
Du Bois, Eugene.
Du Chaillu, Paul B.
Dudley, Henry.
Duke, John H.
Dun, R. G.
Duncan, William Butler.
Dunscomb, Richard T.
Dunshee, Henry W.
Dupee, James A.
Durant, Thomas C.
Dutilh, E.
Dwight, James F.
Dwight, Theodore W.
Duyckinck, Evert A.

Eads, James B.
Eaton, Dorman B.
Eaton, John.
Eaton, D. Cady.
Eaton, Sherburne B.
Edey, Charles C.
Edwards, Jonathan.
Egleston, Henry P.
Eidlitz, Marc.
Eimer, Charles.
Eldridge, Titus B.
Ellers, Geo. Howard.
Ellinger, Moritz.
Elliott, John.
Ellis, John W.
Ely, D. J.
Ely, Richard S.
Emmet, Thomas Addis.
Emot, James.
Endicott, Francis.
Engler, Ad.
Entwisle, Edward.
Ernst, C. W.
Esterbrook, Rich'd, Jr.
Evarts, William M.
Evans, Walton W.
Ewen, John, Jr.
Eyre, Henry S. P.

Fabbri, Egisto P.
Fabbri, Ernesto G.
Faile, Charles V.
Faile, Thomas H.
Fairfield, Walter S.
Farragut, Loyall.
Fargo, William G.
Fargo, James C.
Farrell, Thomas M.
Farquhar, Francis U.
Fatman, Lewis.
Fay, A. Goodrich.
Fay, Richard S.
Fellows, John P.
Fenton, D. W.
Fernbach, Henry.

Ferry, George J.
Field, Dudley.
Field, H. M.
Field, Cyrus W. (L. F.)
Field, David Dudley.
Field, Charles M.
Field, B. H. (L. F.)
Fish, Hamilton.
Fisk, Clinton B.
Fisk, Harvey.
Fithian, Freeman J.
Fleet, Oliver S.
Fliess, William M.
Flint, Thompson J. S.
Fogg, William H. (L. F.)
Folsom, George W.
Foote, Emerson.
Ford, James B.
Forman, Alexander.
Foster, Frank P.
Foster, William R.
Forster, Robert.
Forsyth, John.
Foshay, James W.
Foster, J. P. G.
Foulke, Joseph.
Foulke, Thomas.
Fougera, Edmund C.
Fowler, Edward P.
Fox, Austen G.
Fox, Baldwin N.
Frame, Charles P.
Francis, John M.
Francis, Lewis.
Francklyn, C. G.
Fraser, James.
Fraser, Edward A.
Freedman, John J.
Froebel, Charles.
Frohwein, Theobald.
Frothingham, O. B.
Fuller, Charles D.
Funch, Christian F.
Furniss, William.

Gabb, William M.
Galpen, Horace.
Gambrill, C. D.
Gardner, Hugh.
Garland, John R.
Garrison, C. K.
Gautier, Dudley G.
Gebhard, William H. (L. F.)
Gedney, Frederick G.
Gerard, James W.
Germond, Wellington.
Gerry, Elbridge T. (L. F.)
Gerson, Julius.
Gibbs, Theodore K.
Gibert, Fred E.
Gilbert, Clinton.
Gibson, James.
Gilman, William C.
Gilman, Charles F.
Gillmore, Q. A.
Gillett, Daniel W.
Gilsey, Peter.
Gitterman, Henry.
Glaubensklee, Theodore G.
Gleason, Wesley.
Godon, Sylvanus W.
Goepp, Charles.
Goldsmith, Jacob.
Gomez, Raphael M.
Goodsell, James H.
Gordon, Robert.
Gottsberger, William S.
Graham, C. K.
Graham, James L. (L. F.)
Grain, Francis H.
Gray, Frank A.
Gray, Horace.
Green, Andrew H.
Greene, G. S.
Greene, G. S. Jr.
Greenwood, Isaac J.
Greene, John W. (L. F.)
Greenebaum, David S.
Green, John.
Green, John C. (L. F.)
Greenleaf, Augustus W.
Greene, F. V.
Gregory, James F.
Grinnell, Robert M.
Griswold, George. (L. F.)
Grosvenor, James B.
Guernsey, Egbert.
Gunther, Charles G.
Gunther, William H.
Gunther, F. F.
Guth, John.

Hadden, John A. (L. F.)
Haight, Charles C.
Haight, Edward, Jr.
Haines, John P.
Haldeman, S. S.
Hallgarten, Adolphus.
Hallgarten, Charles L.
Hall, A. Oakey.
Hall, Elial F.
Hall, Randall C.
Halleck, Henry W.
Hallock, Mrs. Francis.
Halsted, Geo. B.
Halsted, William M.
Hamersley, Louis C. (L. F.)
Hamersley, A. Gordon. (L. F.)
Hamersley, John W. (L. F.)
Hamilton, Alexander, Jr.
Hammond, William A.
Hammond, Henry B.
Hampton, Elwood.
Hancock, Winfield S.
Hand, Clifford A.
Hand, Robert N.
Hanemann, John F.
Harbeck, John N.
Harper, Nathan.
Harper, P. J. A.
Harris, Townsend. (L. F.)
Harris, Sigmund.
Harrison, Thomas F.
Hartt, Charles F.
Hascall, William S.
Hatch, Rufus.
Hatfield, J. B. T.
Havemeyer, James.
Havemeyer, Hector C.
Havemeyer, John C. (L. F.)
Havemeyer, Theodore A.
Havens, Charles G.
Hawes, James W.
Hawkes, W. Wright.
Hawk, Samuel.
Hawkins, Dexter A.
Haydock, George G.
Hayes, Isaac I.
Hay, Allen.
Hay, John.
Hazard, Rowland R.
Hazen, W. B.
Hegeman, William A. O.
Heins, Wm. F.
Helmuth, William T.

Heminway, Albert G.
Henderson, John C.
Hendricks, M. M.
Hendricks, Joshua.
Hendricks, Edmund.
Hensel, M.
Herring, Silas C.
Herring, Frank O.
Herpich, Charles A.
Heuer, William H.
Hewitt, Abram S.
Higgins, A. Foster.
Hill, Frank A.
Hitchcock, Roswell D.
Hitch, Henry F.
Hoare, W. Robert.
Hoadley, John C.
Hoe, Richard M.
Hoes, William M.
Hoffman, William B.
Hodges, M. F.
Hodgskin, James B.
Hoguet, Henry L.
Hoguet, Robert J.
Holbrook, E. W.
Holbrook, E. F.
Holbrook, Levi.
Holcombe, William F.
Holt, Henry.
Holton, David P. (L. F.)
Holden, Daniel J.
Holman, Frank E.
Hoppenstedt, G. L.
Hoppin, W. W., Jr.
Hoppin, William J.
Houston, D. C.
Howard, Thomas T., Jr.
Howard, John R.
Howell, Charles W.
Howes, Leander T.
Howland, Meredith.
Hoxie, Richard L.
Hoyt, David.
Hoyt, Oliver.
Hoyt, Harlow M.
Hubbard, O. P.
Hughes, John.
Hughes, William H. T.
Hurlbert, William H.
Hunt, Wilson G.
Hutchins, Waldo.
Hun, Leonard G.

Hunter, Edward.
Huntington, C. P.
Hunter, Charles F.
Hunter, John W.
Huntington, Daniel.
Hurlburt, Henry A. (L. F.)
Hutton, Benjamin H.
Hyde, Henry B.
Hyde, Samuel N.
Hyde, Samuel T.

Ingraham, David P.
Ireland, John B.
Isaacs, Isaac S.
Iselin, William E.
Iselin, Adrian, Jr.
Ives, Frederick E.
Ivison, Henry.

Jacob, Ephraim A.
Jackson, H. A.
Jackson, James F.
Jackson, Frederick W.
Jaffray, Edward S.
Jaffray, Robert.
James, Frederick P.
James, D. Willis.
Jameson, Joseph A.
Janssen, Gerhard.
Jarvis, Nathaniel, Jr.
Jarvis, Robert M.
Jay, John. (L. F.)
Jenkins, William L.
Jesup, M. K.
Johnson, Henry W.
Johnson, Henry J.
Johnson, Hezron A.
Johnson, Rossiter.
Johnson, William M.
Johnston, John T.
Johnston, Jas. W.
Johnston, Melville M.
Jones, John D. (L. F.)
Jones, Walter R. T.
Jones, John Q.
Jones, George.
Jones, Edward Renshaw.
Jones, John M.
Jordan, Conrad N.
Jordan, Edward.
Joy, Charles A.
Judson, William D.
Kalbfleisch, Charles H.

Kane, J. Grenville.
Kauffman, Samuel.
Kayser, Julius.
Kearny, Joseph R.
Keck, Thomas.
Keese, Samuel T.
Kelly, Eugene.
Kemble, Gouverneur N.
Kemp, John H.
Kemp, William.
Kendrick, H. L.
Kennan, George.
Kennedy, Robert L.
Kennedy, Harvey.
Kent, Andrew W.
Ketcham, Enoch.
Ketchum, Franklin M.
Keteltas, Eugene.
Kidder, Henry P.
King, Oliver K.
King, George.
King, Lewis.
King, David.
King, Edward.
Kingsland, A. C.
Kingsland, William M.
Kirkland, Charles P.
Kip, Lawrence.
Kitching, Robert N.
Klamroth, Albert.
Kobbé, Herman.
Koonz, P. J.
Knapp, Herman.
Knapp, Gideon L.
Knauth, Percival.
Knoedler, Julius.
Knower, John.
Kunhardt, Henry R.

Lancey, Robert C.
Lane, Smith E. (L. F.)
Lane, George W.
Langdon, Walter. (L. F.)
Langdon, Woodbury.
Lanier, J. F. D.
Lanier, Charles.
Lambert, E. W.
Lamborn, Robert H.
Lamson, Charles.
Larremore, Richard L.
Lathers, Richard. (L. F.)
Lathrop, F. S. (L. F.)
Latting, John J.

Lauterbach, Edward.
Lawrence, John S. (L. F.)
Lawrence, Abraham R.
Lawrence, Joseph B.
Lawrence, Effingham H.
Lawrence, Alexander C.
Lawrence, Samuel B.
Lawrence, George N.
Lawton, Walter E.
Leaman, Walter L.
Leary, Arthur.
Leavenworth, E. W.
Le Comte, Joseph.
Lederle, Joseph.
Lee, Ambrose.
Leggett, Francis W.
Lehmaier, M. H.
Le Moyne, E. M.
Lenox, James.
Leonard, William H.
Lesher, Stephen R.
Leslie, Frank.
Letson, Robert S.
Leuthner, Frederick.
Levino, Alexander M.
Lewis, Walter H.
Libbey, William. (L. F.)
Lienau, Lewis A.
Lindau, Leopold.
Littel, Eugene.
Little, James.
Littlejohn, James.
Livermore, Edwin R.
Livingston, Robert E.
Livingston, John A.
Livingston, Cambridge. (L. F.)
Livingston, Robert J. (L. F.)
Lockwood, B.
Loew, Frederick W.
Lord, George W. T.
Lord, G. De Forest.
Longstreet, Charles A.
Lorillard, Peter.
Lorillard, George L.
Low, Seth.
Low, A. A.
Low, A. Augustus.
Low, Josiah O.
Lowrey, James P.
Ludlow, William.
Luff, George.
Lüling, Chas.
Lydig, David.
Lyell, John H.
Lyman, Edward H. R.

Maas, F. M.
Mackie, Robert.
MacKellar, William.
Maclay, Isaac W.
Maclay, M. B.
Maclay, Robert.
Macy, William H.
Macy, Arthur.
Macmillan, Frederick.
Marcus, Arnold.
Magnus, Carl.
Magoun, George C.
Mailler, W. H.
Mallory, Charles H.
Mallory, John C.
Mali, D. Weyman.
Man, Albon P.
Manners, David S.
Marble, Manton.
Marbury, Francis F.
Marie, Peter. (L. F.)
Marks, Joseph H.
Marquand, Henry G.
Marsh, Luther R.
Marshall, D. D. T.
Marshall, F. Pelham.
Marshall, Charles H.
Marsland, George.
Martin, Bradley.
Martin, George C.
Martin, John M.
Martine, Randolph B.
Martin, Isaac P.
Matsell, George W.
Matthews, Edward. (L. F.)
Mattson, Morris.
May, Lewis.
Maynard, George W.
McAlpine, William J.
McAlpin, David H.
McClure, George.
McCurdy, R. H.
McElligott, Henry R.
McFarland, Walter.
McLanahan, Geo. W.
McLean, James M.
McMahon, M. T.
McMullen, John.
Meeker, William B.
Meeker, H. G.
Menken, J. Stanwood.
Merrall, William J.
Merritt, M. F.
Meyer, F. William.
Meyer, L. H.
Meyer, Theodore F. H.
Michler, Nathaniel.
Miles, Edward D.
Miller, Philip S.
Miller, Edmund H.
Miller, George M.
Mitchell, Edward.
Mitchell, Edwin P.
Mitchell, Grove P.
Mitchell, W. Howard.
Mitchill, Samuel A.
Moir, James.
Monheimer, Joseph A.
Montague, George L.
Monroe, Ebenezer.
Montgomery, Thomas H.
Montgomery, Archibald G. Jr.
Moore, George H. (L. F.)
Moore, Frank. (L. F.)
Moore, W. H. H. (L. F.)
Moore, C. B.
Moore, Henderson.
Moreau, John B.
Morgan, W. F.
Morgan, J. Pierpont.
Morgan, Edwin D.
Morgan, William D.
Morgan, John B.
Morrell, W. H. (L. F.)
Morris, Harry M.
Morris, Henry L.
Morris, Robert R.
Morrison, Henry.
Morrison, Edward.
Morton, Levi P.
Motley, James M.
Mott, Henry A., Jr.
Mott, Alexander B.
Moulton, Clarence F.
Mount, Richard E. (L. F.)
Murphy, Henry C.

Murphy, Thomas.
Murray, D. Colden.
Myers, T. Bailey.
Myers, John K.
Myers, John K., Jr.
Myers, Alfred G.
Myer, A. J. (L. F.)

Neergaard, William.
Negus, T. S.
Neilson, William H.
Neilson, Frederic.
Nesmith, R. D.
Newcombe, Isaac B.
Newell, John.
Newton, Isaac.
Newton, John.
Niblo, William.
Niles, Marston.
Niles, William W.
Nones, Alexander.
Norrie, Adam. (L. F.)
Norris, George.
Northrop, A. L.
Nott, J. V. Henry.
Nourse, J. E.
Norwood, Andrew G.

Oakley, E. Benedict.
O'Conor, Charles.
O'Connor, Thos. H.
Ogden, William B.
Ogden, Alfred.
O'Hara, Charles E.
Olmstead, Dwight H.
Olmstead, Fred'k. Law.
Olney, Peter B.
Olyphant, Robert M.
Oppenheimer, Joseph.
Opdyke, Wm. S.
Orton, William.
Osgood, Franklin.
Ottendorfer, Oswald.
Otterbourg, Marcus.
Ottiwell, John D.
Owen, Edward H.
Owen, Edward L.
Owen, Frederick N.
Owen, Wm. H.

Packer, Elisha A.
Palmer, Courtlandt, Jr.
Palmer, James W., Jr.
Palmer, W. J.
Pancoast, George.
Paris, Sherman.
Parish, Henry.
Parish, Daniel, Jr.
Parke, John G.
Parker, Willard.
Parsons, George W.
Parsons, Levi.
Parton, James.
Paton, John.
Pastor, Henry.
Paulison, John P.
Peabody, Charles A.
Peabody, Arthur J.
Peake, William I.
Peckham, Walton H.
Peet, Wm. E.
Peipers, Hugo.
Pell, Robert L.
Pellew, Henry E.
Penfold, William Hall.
Perkins, Geo. W.
Perry, Oliver H.
Pfeiffer, Carl.
Pfund, Anton.
Phelps, Royal. (L. F.)
Phelps, Charles H.
Phelps, J. N.
Phillips, Charles B.
Phillips, George W.
Phoenix, S. Whitney. (L. F.)
Pierrepont, Edwards.
Pierrepont, J. Jay.
Pierrepont, Henry E., Jr.
Pierrepont, Henry E. (L.F.)
Platt, James N.
Plum, Elias.
Plum, Jas. R.
Poe, O. M.
Pohlman, Wm.
Pondir, John.
Poor, Henry V. (L. F.)
Pope, John.
Popham, William H.
Poppenhusen, Adolph.
Porter, David D.
Porter, John K.
Porter, Horace.
Potter, Howard.
Potter, Clarkson N.
Potter, Orlando B.
Powers, William P.
Powers, George J.
Pratt, Daniel R.
Preble, John Q.
Prentice, W. P.
Prichard, William M.
Prime, William C.
Prime, Frederick. (L. F.)
Prime, Frederick E. (L. F.)
Probasco, Samuel R.
Pruyn, John V. L.
Pullman, Geo. M.
Pumpelly, Raphael.
Purser, George H.
Putman, F. W.
Putzel, Mayer.
Pyne, Percy R.

Quinn, James B.
Quintard, Edward A.

Raht, Richard.
Ramsey, Charles G.
Randolph, A. D. F.
Ranft, Richard.
Ransom, F. A.
Rapallo, Charles A.
Rathbone, Aaron H.
Raven, Anton A.
Raynolds, C. T.
Read, J. Meredith.
Reckendorfer, Joseph. (L. F.)
Redding, George H.
Reed, Mrs. Sylvanus.
Reid, Whitelaw.
Reinhart, B. F. (L. F.)
Remsen, William.
Renauld, Peter A. H.
Requa, James M.
Reynes, Jayme.
Rhinelander, William C.
Rhoades, John H.
Rhoades, Lyman.
Richard, Charles B.
Richards, Augustus D.
Richard, Auguste.
Richardson, William A.
Richmond, Henry A.
Riker, William J.
Riley, Charles V.
Rives, G. L.
Rives, Francis R.
Robbins, Henry A.
Robbins, H. W., Jr.

Robbins, Chandler. (L. F.)
Robbins, George S.
Robeson, George M.
Roberts, Nathan B.
Roberts, Marshall O.
Robinson, Eugene N.
Robinson, Henry E.
Rodriquez, J. C.
Roelker, Bernard.
Rogers, H. Livingston.
Rogers, C. B. (L. F.)
Rollins, Daniel G., Jr.
Rollins, Edward A.
Roosevelt, Clinton.
Roosevelt, Theodore.
Rossell, William T.
Rose, Charles.
Rose, Cornelius.
Rosenfeld, Isaac.
Ross, Arthur.
Ross, Wm. B.
Riker, John H.
Ruggles, Samuel B.
Ruggles, Philo T.
Russell, Archibald D.
Rutherfurd, L. M.
Rutherfurd, John A.
Rutton, August.

Sachs, Henry M.
Salomon, Edward.
Sands, Andrew H.
Sands, Philip J.
Sands, Harry M.
Sanford, Samuel B.
Sandford, Elliott. (L. F.)
Sanger, A. L.
Savage, John.
Sawyer, Warren.
Schack, Fred.
Schafer, Samuel M.
Schafer, Simon.
Schaus, William.
Schell, Richard. (L. F.)
Schell, Augustus. (L. F.)
Schem, Alex. J.
Schermerhorn, W. C.
Schermerhorn, F. Augustus.
Schieffelin, H. M.
Schieffelin, Samuel B.
Schiff, Jacob H.
Schlesinger, Alfred.
Schlesinger, B.
Schmidt, Oscar E.
Schofield, John M.
Schultz, Carl H.
Schultz, John H. (L. F.)
Scott, Julian. (L. F.)
Scott, Henry L.
Scott, Thomas A.
Scribner, John B.
Scudder, Henry J.
Seligman, James.
Seligman, Jesse.
Seligman, Joseph.
Seward, Clarence A.
Sewall, Henry F.
Sewell, Robert.
Shaler, Alexander.
Sharpe, George H.
Shea, George.
Sheafe, J. F.
Sherman, Isaac.
Sherman, W. Watts.
Sherman, Benjamin B.
Sheridan, Philip H.
Sherwood, John.
Shethar, Samuel.
Short, Charles.
Sibley, Henry H.
Sibley, Hiram W.
Siegman, Michael.
Sigel, Franz.
Simons, S. A.
Simpkins, N. S., Jr.
Simpson, James H.
Sistare, George K.
Skidmore, Jeremiah.
Slevin, Thomas E.
Sloan, Samuel.
Smales, Holbert.
Smith, Augustine.
Smith, Apollos.
Smith, Dwight.
Smith, Lewis Bayard.
Smith, Charles S.
Smith, George P.
Smith, Harsen H.
Smith, James O.
Smith, James M., Jr.
Smith, Daniel D.
Southworth, Alvan S. (L. F.)
Spaulding, Henry F.
Spencer, Charles S.
Spencer, James C.
Spingarn, Siegmund.
Spinney, Joseph S.
Spofford, Paul N.
Squires, Robert.
Stanford, William H.
Stanton, Walter.
Stebbins, Henry G.
Steiger, E.
Steinway, William.
Stengel, Frederick.
Stern, Myer.
Stevens, Alexander H.
Steward, D. Jackson.
Stewart, Charles S.
Stewart, Charles J.
Stiger, William E.
Stillwell, Benjamin M.
Stokes, James.
Stone, A. B.
Stone, Charles F.
Stone, Henry.
Storrs, Charles. (L. F.)
Stoughton, Charles B.
Stoughton, Edwin W.
Stout, Francis A. (L. F.)
Stranahan, J. S. T.
Strazburger, Oscar.
Strebeigh, Robert M.
Striker, J. A.
Strong, W. L.
Struve, G. A.
Strong, Charles E.
Stryker, Wm. S.
Stuart, W. Whitewright.
Stuart, Robert L.
Stuart, Alexander.
Stuart, Joseph.
Sturges, Henry C.
Sturges, Frederick.
Sturgis, Frank K.
Sturgis, Appleton.
Stuyvesant, Rutherford. (L. F.)
Stuyvesant, Robert R.
Suckley, George. (L. F.)
Sulzbacher, Wm.
Sutherland, Josiah.
Swan, William H.
Swarr, David M.

Taintor, Charles M.
Talmadge, Henry P.
Tappan, J. Nelson

Tapscott, James J.
Taylor, Douglas.
Taylor, George.
Taylor, Bayard.
Taylor, Alfred J.
Tefft, Erastus T.
Tellkampf, T. A.
Terbell, Henry S.
Terry, Edward.
Terry, Alfred H.
Terry, Roderick.
Therasson, L. F.
Tompkins, E. H.
Tompkins, Hamilton B.
Thompson, David G. (L. F.)
Thompson, John C.
Thompson, Joseph P.
Thomson, James.
Thorne, Jonathan.
Thorne, William H.
Thornell, Thomas L.
Thurber, Francis B.
Tiemann, P. C.
Tiffany, Charles L.
Tilden, Samuel J.
Tilden, Wm.
Toel, Wm.
Tooley, James W.
Totten, Geo. M.
Tousey, Sinclair.
Tower, Z. B.
Townsend, Martin I.
Townsend, Randolph W.
Tracy, William.
Tracy, Charles.
Tracy, John F.
Tremain, Edwin R.
Trenchard, Edward.
Trevor, John B.
Tucker, Paul.
Tuckerman, Lucius.
Turner, Herbert B.
Twining, W. J.
Tyler, Arthur W.

Uhl, Herman.
Upton, Emory.

Van Alen, James J.
Van Alen, J. H.
Van Brunt, Cornelius.
Van Brunt, Charles H.
Van Buren, John D., Jr.
Van Hoesen, Geo. M.
Vance, Samuel B. H.
Van Rensselaer, K.
Van Santvoord, C.
Van Volkenburgh, P.
Van Vorst, Hooper C.
Valentine, Lawson.
Vanderbilt, W. H.
Vanderpoel, Aaron J.
Vanderpoel, A. Ernst.
Varick, Theodore R.
Vail, Henry F.
Viele, Egbert L.
Verhuven, Henry F.
Vincent, Frank, Jr.
Von Post, H. C.
Von Dorrien, S.
Voorhis, William.
Vyse, Thomas A., Jr.

Wadsworth, Julius.
Waite, M. R.
Waite, Charles C.
Wales, Salem H.
Walker, Evan T.
Walker, William.
Wallack, J. Lester.
Waller, Elwyn.
Wallis, George B.
Walter, Ellwood.
Walraven, Ira E.
Ward, George C. (L. F.)
Ward, Elijah.
Ward, Roswell B.
Warren, James K.
Warren, Gouverneur K.
Warren, George Henry.
Warner, Lewis T.
Watson, William.
Watson, B. F.
Watson, John H.
Watts, Ridley. (L. F.)
Webb, Alexander S.
Webb, William H.
Weber, Leonard.
Weber, Albert.
Webster, Sidney.
Wedemeyer, A. J. D.
Weeks, John A.
Wells, Jacob.
Wendell, Jacob.
Wesendonck, Hugo.
Westermann, B.
Weston, Theodore.
Wetmore, George P. (L. F.)
Wetmore, Samuel. (L. F.)
Wetmore, William B. (L. F.)
Weyman, Charles S.
Wheeler, John V.
Wheeler, Everett P.
Whipple, C. W.
White, David.
White, H. C.
White, Alexander M.
White, Charles T.
White, Loomis L.
Whitehead, Wm.
Whittier, John G.
Wiener, Joseph. (L. F.)
Wilcox, Franklin A.
Wilkeson, Samuel.
Wilson, J. H.
Wilson, James G. (L. F.)
Willard, Seymour.
Willard, J. H.
Willets, Samuel.
Wilder, Marshall P.
Wilkes, George.
Williams, Geo. B.
Williams, Stephen C. (L.F.)
Williamson, David B.
Windmüller, Lewis.
Windmüller, T.
Winslow, Edward F.
Winston, Frederick, S.
Wissman, J. F.
Witthaus, G. H. (L. F.)
Wood, Fernando.
Woodruff, Israel C.
Work, J. Henry.
Wolfe, Christopher.
Worthen, William E.
Worth, James L.
Wooster, George H.
Wreaks, Charles F.
Wright, E. Kellogg.
Wrigley, Henry E.
Wyckoff, Jacob F.

Young, Mason.
Youngs, Henry I.
Yoshida, Kiyonari.

Zachos, J. C.
Zborowski, Martin.
Zollikoffer, Oscar.

PART I.

TRANSACTIONS

OF THE

SOCIETY FOR THE YEAR 1876.

TRANSACTIONS OF THE SOCIETY FOR 1876.

Annual meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue, New York, on Tuesday, January 11, 1876.

Prof. Roswell D. Hitchcock, LL. D., in the chair.

The reading of the minutes of the previous meeting was, on motion, dispensed with.

The chairman, on calling the Society to order, expressed the thanks of the meeting to the ladies of the Union Home and School for the volunteered services of their band of music, composed entirely of boys.

The following named persons were declared duly elected Fellows of the Society:

August Buechner, John E. H. Hyde, Albert G. Heminway, W. H. Clarke, S. J. Douglass, T. R. Appleton, Wm. H. Owen, Henry Holt, Henry W. Halleck, Mrs. Geo. W. Cullum.

Life Members — Prof. Alex. J. Schem, Herman Kobbe.

Corresponding Members — W. E. Johnston, Esq., Paris, France; Gen. Chas. P. Stone, Egyptian army, Cairo, Egypt; Frank B. Passmore, C. E., New Zealand; Antonio Rimoudi, Peru.

The treasurer, Mr. Geo. Cabot Ward, read his annual report, showing a cash balance to the credit of the Society of $1,430.89, and as a permanent fund the sum of $2,084.22. The report was accepted and ordered on file.

The annual report of the Council for 1875 was then read by Mr. Wm. Remsen, chairman, and, on motion, it was accepted and ordered on file.

The following amendments to the by-laws of the Society were offered by Mr. Harlow M. Hoyt:

Resolved, That chapter 12, section 6, be amended by striking out the following: "He shall receive, for his services, such salary or pecuniary compensation as shall be determined by the Society or the

Council; but neither in the Society nor in the Council shall he have a vote on any question relating to or affecting his salary or pecuniary compensation."

Resolved, That chapter 14, sections 3 and 8, be amended so that they shall read as follows:

"§ 3. It shall appoint the necessary agents, clerks and servants of the Society with such powers and duties, privileges and compensation as it may from time to time determine, and may, at pleasure, revoke such appointments and make others in their stead.

"§ 8. No member of the Council shall receive any salary or pecuniary compensation for his services."

Laid over for action under the rule until the next meeting of the Society.

Mr. Francis A. Stout offered the following resolution:

Resolved, That a committee of five members of the Society be appointed by the chair to examine and consider the subject of a topographical survey of the State of New York, and to report to the Society in writing at its next meeting or to the Council.

Which was duly seconded and adopted.

The chair appointed the following committee: Samuel B. Ruggles, chairman; Francis A. Stout, James T. Gardner, Eldridge T. Gerry and William Remsen.

The committee on nominations presented the following report:

The committee appointed under a resolution passed at the last meeting to nominate a list of officers for the ensuing year beg leave to report: The recording secretary, Alvan S. Southworth, Esq., having resigned in consequence of pressing business and personal engagements, and the committee having been apprised that the Council have unanimously recommended the passage of a resolution by the Society restoring the former by-law that no elected officer should receive any salary or pecuniary compensation for his services, your committee have nominated Elial F. Hall, Esq., for recording secretary, that gentleman having kindly consented to discharge gratuitously the duties hitherto entrusted to the recording secretary until the newly elected Council can secure the services of an efficient person at the compensation paid by the Society for the discharge of these duties. For the three places in the Council made vacant by the death of Mr. Wm. Tilden Blodgett and the resignations of Messrs. Southworth and Hoppin the committee have selected Clarence King, Esq., the chief of the late western expedition for the survey of the fortieth parallel, Dr. Isaac I. Hayes, the explorer of the Arctic, and Paul B. Du Chaillu, Esq., the well known African traveler. With these changes, the committee recommend the gentlemen hereafter named for election as

officers and members of the Council for the ensuing year. We also recommend the adoption of the following resolution:

Resolved, That the thanks of the Society be returned to our retiring secretary, Alvan S. Southworth, Esq., for the warm interest he has always manifested in the Society, and the efforts he has made to promote its welfare and to advance its objects.

Officers and Council, 1876.

President — Chas. P. Daly.

Vice-Presidents — Frederick A. Conkling, Francis A. Stout, Geo. W. Cullum.

Foreign Corresponding Secretary — E. R. Straznicky.

Domestic Corresponding Secretary — James Muhlenberg Bailey.

Recording Secretary — Elial F. Hall.

Treasurer — George Cabot Ward.

Council — William Remsen, Theodore W. Dwight, T. Bailey Myers, W. H. H. Moore, William E. Curtis, Walton W. Evans, Isaac Bernheimer, H. Manigault Morris, Charles A. Joy, Harlow M. Hoyt, Roswell D. Hitchcock, Samuel L. M. Barlow, Isaac I. Hayes, Paul B. Du Chaillu, Clarence King.

(Signed) THOMAS F. HARRISON, Chairman,
HENRY MORRISON,
THEO. A. TELLKAMPF, M. D.,
Committee.

The above report of the nominating committee was, on motion, unanimously adopted.

The Society then proceeded to a ballot, which resulted in the unanimous election of the above given ticket.

The Hon. S. Wells Williams, M. D., LL. D., secretary of legation at Pekin, China, was introduced and delivered a discourse upon "China, its Geography, People and Relation to the Other Nations."

On motion of the Rev. Dr. Wm. Adams, the thanks of the Society were extended to Dr. Williams for his able discourse, and a copy of it was requested for publication in the journal.

On motion the Society then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue.

NEW YORK, *February* 26, 1876.

Prof. ROSWELL D. HITCHCOCK, LL. D., in the chair.

The reading of the minutes of the previous meeting, January 11, 1876, was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected Fellows of the Society: A. G. Constable, William B. Ross, William G. Lathrop, Jr., Germain Hauschel, J. C. Rodriquez, Gen. Clinton B. Fisk, James P. Robinson, J. C. Ayer, M. D., R. F. Stevens, Louis A. Cuppia, Simeon I. Drake, William F. Nisbett, Richard H. Bowne, William Rockefeller, J. A. Bostwick, John A. Church, Harsen H. Smith, Frank P. Foster, Admiral C. H. Davis, U. S. Navy; Hiram W. Sibley, A. F. Hastings, J. Nelson Tappan, Roswell B. Ward.

Corresponding Members — David Murray, M. D., Tokio, Japan; Major Fred Hotchkiss, Staunton, Va.; Walter G. Blackie, F. R. G. S., Glasgow.

On motion of Mr. Harlow M. Hoyt, the amendments to chapter 12, section 67, to chapter 14, sections 3 and 8 of the by-laws, offered by him at the last meeting of the Society, January 11, 1876, were taken up and passed.

The chair introduced Chief-Justice Daly to the Society, who delivered his annual address upon the "Geographical Work of the World in 1875," illustrated by stereopticon views.

The Society, on motion, then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue.

NEW YORK, *March* 30, 1876.

Chief-Justice DALY in the chair.

The reading of the minutes of the previous meeting, February 26, 1876, was, on motion, dispensed with.

Mr. Charles Harris Phelps was introduced to the Society, who read a paper entitled "A Journey from Finland to Persia, Daghestan and Circassia," and Mr. Henry Ballantine read a paper entitled "A Trip through Interior Persia to St. Petersburg." Both papers were illustrated by stereopticon views.

On motion the Society then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue.

New York, *April* 18, 1876.

Chief-Justice Daly in the chair.

The reading of the minutes was, on motion, dispensed with.

The following named gentlemen were, on the recommendation of the Council, declared duly elected Fellows and Corresponding Members of the Society:

Fellows — Edward Trenchard, Copley Amory, Henry F. Spaulding, Chauncey M. Depew, Robert S. Hale, John C. Peters, M. D., A. H. H. Dawson, Evan F. Walker, William L. Andrews, James Buell, H. L. Barnett, Ward B. Burnett, Frank R. Lawrence, W. Robert Hoare, Marston Niles, George B. Newell, Fred Law Olmsted, Dudley G. Gautier, Samuel Stillman Conant, A. Foster Higgins, Geo. W. Perkins, Geo. M. Van Hoesen, Percival Knauth, George B. Halsted, William M. Allen.

Corresponding Members — Demitri Botassi, of Greece, New York; Dr. Gerhard Rohlf, African traveler.

Major A. G. Constable was introduced to the Society, who delivered a discourse entitled "A Talk about Hindustan," illustrated with stereopticon views.

Mr. Harlow M. Hoyt offered the following preambles and resolutions, which upon motion were duly adopted:

It is well known that efforts are being made for the purchase or erection of a building for the use of this Society. Of the amount subscribed $27,150 has been collected and placed in bank. Negotiations are now pending for a suitable site, and, in accordance with our by-laws, it becomes necessary for the Council to obtain the authority of the Society to incur any liability which may exceed $1,000 in amount.

I therefore beg to offer the following resolutions, that the action of the Council may receive the approval of the Society:

Resolved, That the Council of this Society be and they hereby are authorized to expend, under the directions of the finance committee, such a sum or sums of moneys as said committee may hereafter from time to time set apart or appropriate, for the erection, purchase or alteration of a building or buildings, as well as for the furnishing and fitting up of the same, for the use and occupation of this Society, and for the payment or extinguishment of any mortgage which may be upon such building or buildings, or the land on which the building or buildings may be, now or hereafter erected.

Resolved, As in furtherance of this project it may become neces-

sary to sell or dispose of some of the property of this Society, the value of which may exceed $1,000, that the Council, under the direction of the finance committee, be and they hereby are authorized to make such sale or disposition of the property of this Society as may be necessary and proper.

On motion the Society then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue.

NEW YORK, *June* 1, 1876.

Chief-Justice DALY in the chair.

The reading of the minutes of the last meeting was dispensed with upon motion.

The following named gentlemen were, on the recommendation of the Council, duly elected Fellows:

Dwight H. Olmsted, Robert H. Lamborn, Ph. D., William Tilden, Levi Parsons, Wm. E. Peet, James R. Plum.

The following was, on motion of Mr. Francis A. Stout, unanimously adopted:

Whereas, The distinguished artist, our fellow-member, Mr. B. F. Reinhart, has presented to the Society a portrait executed by himself from the life, of our honored president, Chief-Justice Daly, and,

Whereas, In so doing he has thus testified his attachment to the Society, and his admiration for our president, who was one of its founders; therefore,

Resolved, That we hereby tender to Mr. Reinhart our grateful and appreciative thanks for the excellent work of art with which he has endowed the Society, which will ever cherish and preserve it as among the best and most valued treasures in its possession.

Mr. George Kennan, being introduced to the Society, read a paper upon his "Dog-Sledge Travel in Kamtschatka and North-eastern Siberia."

On motion the Society then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue, New York, July 10, 1876, for the reception of Dom Pedro d'Alcantara (Emperor of Brazil), Dr. Augustus Petermann, of Gotha, Prof. A. E. Nordenskjöld, of Stockholm, and Dr. G. H. Berendt, of Guatemala. They were all present with the exception of Prof. Nordenskjöld.

Chief-Justice Daly in the chair:

On the recommendation of the Council, the following named gentlemen were declared duly elected Fellows:

James Lawrence Breese, Hamilton B. Tompkins, James L. Banks, M. D., James W. Johnson, Rossiter Johnson, Nicola Rienzi Monachesi, E. L. Finlay, M. D., Julius Gerson.

On motion of Colonel T. Bailey Myers, Dom Pedro d'Alcantara (Emperor of Brazil) was unanimously elected an honorary member.

Addresses were made by Dom Pedro, Dr .Petermann, Dr. Berendt, Dr. Isaac I. Hayes, Bayard Taylor, Esq., the president and others. (See published account, bulletin No. 2, session 1875–1876.)

On motion the Society then adjourned.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Fifth avenue.

New York, *October* 31, 1876.

On the recommendation of the Council the following gentlemen were declared duly elected:

Fellows — Nathan Appleton, P. J. Koontz, M. D., Edwin P. Mitchell, W. Howard Mitchell, George Howard Ellers, John C, Thompson, Cornelius Van Brunt, Gilbert F. Davis, Silas M. Stilwell, Jr., William W. Laman, Andrew W. Kent, Commodore Charles H. Baldwin, United States Navy, Frank E. Holman, Waldemer de Bodisco, Wright Smith, M. D.

Corresponding Members — Alexander Peroff, of St. Petersburg, Russia, G. H. Berendt, M. D., of Guatemala.

Mr. Francis A. Stout offered the following resolution to amend chapter 5, section 2, of the by-laws, as follows:

Chapter 5, Sec. 2. The officers and members of Council elected at the next annual election (except the president and treasurer) shall, at their first meeting, divide themselves into three classes, each to embrace one vice-president, one secretary and five members of the Council, one of which classes shall hold office one year, one for two years, and another for three years, to be determined at said meeting by lot or otherwise. The president and treasurer shall always be elected annually, and at each annual election thereafter there shall be elected a vice-president, secretary and five members of Council, each for the term of three years.

In accordance with the constitution and by-laws, the amendment was laid over until the next meeting before being acted upon by the Society.

Commodore Daniel Ammen, U. S. Navy, contributed a paper entitled "The Surveys and Reconnoissances from 1870 to 1875 for a Ship Canal across the American Isthmus," which was read by Mr. James T. Gardner, general secretary of the Society.

Addresses were made by Prof. Roswell D. Hitchcock, LL.D., Prof. Wm. H. Thomson, M. D., and by Mr. Wm. H. Goodyear, upon "Palestine Explorations beyond the Jordan," illustrated by stereopticon views.

On motion the Society adjourned.

Reception at the opening of the Society's new rooms, No. 11 West Twenty-ninth street, on November 28, 1876.

Col. T. BAILEY MYERS in the chair.

OPENING OF THE NEW ROOMS OF THE SOCIETY.

Generous contributions from officers and members of the Society, and from public-spirited citizens, having furnished means to purchase the much-needed building for the library, maps, social meeting rooms and business offices of the Society, two receptions were held at the new rooms, that members of the organization and the public might become quickly and pleasantly acquainted with the increased facilities for geographical study and social intercourse.

The five floors of the building, devoted respectively to the business offices, the parlors and collections, the library, the map rooms, and the Council chamber, were visited by a large number of members, and the following addresses delivered:

RECEPTION ON TUESDAY EVENING, NOVEMBER 28TH.

WELCOME BY COL. T. BAILEY MYERS.

After stating that as Chief-Justice Daly, the president, was too ill to be present, he had been requested to bid the guests an informal welcome to the Society's new home. Even absent, his forethought has provided a fitting substitute for the words of welcome he would address to you, in suggesting to one of our oldest and best esteemed members that he should unite in saying to you a word of kindly greeting, and give you some suggestions as to the causes which have brought us together, and the results likely to result from such association.

"I have the honor, ladies and gentlemen, to present to you the Rev. Dr. Bellows. He needs no formal introduction. His name is familiar to you all."

Address of Rev. Dr. Bellows.

In the regretted absence of the devoted and learned president, I am suddenly called upon to give voice to the feelings of the members of this Society in taking possession of its new home. I am relieved to think that it is a merely social and festive occasion, when we meet to exchange congratulations, shake hands, and look into each other's faces, and not to advance our knowledge of the science to which this Society is devoted. For I am neither fitted by pursuits, acquaintance with the history and progress of the Society, nor by knowledge of its science, to instruct you, nor to tell you what it would be so pleasant to hear — the story of your own struggles, wanderings and prospects. You see around you, in these delightful rooms, in your well lodged library of 12,000 volumes, your repository of maps and charts, enough to be grateful for, and plain evidence of the enterprise, liberality and skill with which your committee and the friends of the Geographical Society have provided at last an independent and decent abode for the treasures and the work of the association. May it never lose its present home, until an edifice worthy to represent the great public interests of the Society rises on some conspicuous site to demand the attention of the whole community, and signalize and promote the grand success of our noble enterprise.

Fortunately, it requires no special acquaintance with geographical science to appreciate the importance of this occasion, but only a sympathy with all efforts to widen the range of human knowledge, and bring into our busy civic life the air of liberal studies, and of pursuits that have the unselfish and general interests of humanity for their object. To an old citizen, profoundly concerned for the moral and intellectual life of New York, no effort that tends to promote a wider acquaintance with nature and the laws of the universe, a broader view of human interests, a profounder conception of the tie that binds the race and the world together, can be indifferent. It is refreshing to pass from the heated air of political, partisan and private anxieties into the cool alcoves where only impersonal topics, scientific truths and discoveries that belong to our whole humanity engage and feed the mind, instead of irritating and fevering its passions.

And certainly, if any science has claim to largeness and comprehensiveness, and a calmness below the surface of private and personal agitations, it is geography. It is a survey of the platform on which

all human interests stand — a knowledge of the very ground on which all sciences and arts must rest. In its astronomic, its physical and its political departments, it covers the whole domain of science and art, and requires and makes tributary to itself all studies and all knowledge. It is wider than country, race or sect, covers the land and the sea, and makes geology and astronomy, prehistoric and prophetic, parts of itself. Yet it begins with what is simplest and most inviting to infant intelligence, and stretches on to what baffles or rewards the profoundest speculation and research. What early study so universally charming as geography — what later one so inexhaustible and so tasking in its interest and suggestiveness? The village school and the library of a Humboldt or a Ritter may equally serve to indicate its charm and its early beginning and never-ending hold upon the human mind.

No country, surely, has a greater claim on its people for the promotion and honor of geographical science than America. We are ourselves the product of the noble passion for discovering and exploring the outlying and unknown regions of the earth. But for the sacred instinct that drives man never to submit to ignorance of what can be known, to move back the boundaries that hem in his motion and imprison him in threatening seas and arid deserts, that provokes his curiosity and overcomes his fears when suspicions of possible possessions awake in his brooding mind — we should never have had the Cabots, the Amerigo Vespucci and the Columbus that, under God, called our hemisphere and our country out of the mists and the ignorance of ages into the knowledge of the old world and the use and possession of the children of the new. America is the sublime and permanent, the unsurpassable triumph and monument of geographical enterprise. She must partly pay back the debt she owes the faith and boldness of the sons of the other hemisphere by gleaning what remains of the harvest of geographical research, especially in those portions of the globe more open to her navigators or savans, and contribute it to the general sum of knowledge, which has now become so great, of this long unexplored and unknown globe. Africa, the Poles and part of Asia still invite her explorations, and we will not forget that Wilkes and Kane and Hayes and Hall, and the finder of Livingston, and, latest of all, Schuyler, in his bold and fruitful journey into the regions between Russia and the east, have partly shown what America can do to vindicate her claim to be a grateful child of the foster mother that found and lifted her cradle from the waters.

The study of the earth — and geography includes all — is perhaps the most grateful and affectionate tribute immortal man can pay his birth-spot. For here, whatever and however much grander his experience of life and being, of nature and divine laws may become, here he began to be. Here he opened his eyes upon the external universe; here he first saw form and color, and grasped substances, and welcomed air and light, and heat and motion. Here he first thought and felt, and looked up at the stars, and down upon the flowers, and had his first exquisite taste of the mystery and glory and charm of existence. No other world can repeat this ever sacred and memorable experience. He cannot again *begin*, however endlessly he may continue his being. Here the thought and the feelings of his Creator first stole into his heart; here he first tasted the fruit of the knowledge of good and evil, and felt the first throbs of love and fear, of hope and of regret. This will ever remain his cradle and nursery — the place where he made his earliest acquaintance with himself, his race, his Maker, with art and science, and had his first outlook into the starry universe. Here, then, is the site of his first observatory; here the origin of his alphabet of communication with heaven and earth; here the unit of all he knows and can know.

And if there be any thing more fitted to arouse our love and reverence for our earth, and our devotion to its study, it is the growing confidence which science acquires, that its laws, its substances, its revelations, are not of things local and temporary; that it is a sample of a universal texture, made of elements that exist and rule in the most distant spheres; that its laws extend to it from a divine center that sweeps into unity all other worlds, and that its knowledges and sciences do not end here, or have their uses superseded or belittled by what is to be learned hereafter, but only carried on, increased and perfected. The universe is, indeed a university; but this grammar-school of earth, with its little museum of wonders and patterns, is stored from the university itself, and conducted under the same head, so that it is truly a preparatory school, whose lessons will not prove unrelated to those higher studies before us in other stages of knowledge. I can believe that the arches of heaven itself may have rung when Newton and Kepler, Laplace and Humboldt entered the abode where what we vainly call *earthly* science and art are proved immortal and not less honored, but only further known and prized; and it is no profane fancy that the great explorers of earth and sky may

celebrate their human achievements, and keep the anniversaries of the day when they made their first great discoveries, even amid the joys and victories of their new abodes. The dear old earth, our birthplace and first school-room, will not fade wholly from our memory when it is lost to our sight. It is not only our failure to improve its moral and spiritual lessons we shall have occasion to lament, but even our negligence to learn all that its physical laws and its open secrets were trying to teach us. I confess that I am jealous of the ignorance I still have of its treasures; that I would linger long enough to learn more of all its climates and zones, its mineral products, and its living creatures, the relations of its mountains and rivers, its climates and the ocean currents and winds that seem to determine them; of the secular changes in its shifting zones; of the mysteries of its electric streams, and of the relations which coast lines, and ice-crowns, and the ocean rivers of the gulf and of the Japanese sea have to its commerce, its climates, the dispersion of its early inhabitants, and the settlement of our own Indian, Central American, Mexican and Peruvian predecessors. The earth may wither and grow black with cold and darkness, but it will be forever the monument and tomb of fortunes and experiences that cannot be dissociated from it; and if its little sphere be visible to any more powerful vision or lenses that celestial spirits use, the eyes of myriads will be strained fondly back upon it, even from the hights of immortal joy.

It is a subject of high congratulation that this Geographical Society exists at an epoch when science has entered upon a glorious and triumphant career, and for the time enlists the most earnest and distinguished intellects of the whole cultivated world in its service. Never before was science so high enthroned in the respect and honor of the people at large! Its leading expositors now have, as none others, the ear of the curious and thoughtful world. Its heroes and benefactors are crowned with favors, the chiefest being an eager attention to every thoughtful word they utter. Its savans wear names not confined, as of old, to the knowledge of academies and peers in science, but which have become household words. For the time, at least, metaphysical, æsthetic and theological pursuits take back seats at the court where science pushes to the front, as if to her native and eternal rank in the fitness of things! "To every thing its season," and this is the hey-day of science. Neglected, dreaded, persecuted, poor, compelled to practice secrecy or to bear ignominy in the past — science now has at last a chance to take her revenge.

And she seems to many to be not wholly indisposed to visit upon her old scorners some of the vials of wrath they once poured on her naked head. I share none of the apprehensions which timid religionists have sometimes experienced, that science can turn atheistic and unmoral, as her characteristic bent. She is under law, and has to teach and tell at last only what she observes and learns from facts and phenomena that she did not make and cannot unmake. And religion and theology, its hand-maid, are under law, too, and cannot make and unmake the facts on which they must finally rest, and to which they must conform. Theology must sometimes sit at the feet of physical science, when she knows and teaches facts that lie out of theology's way to observe and describe — and science will sooner or later see that moral and spiritual facts are none the less *facts* because harder to fix and weigh, and that the science of God is the queen of sciences, and will have its rights and honors acknowledged by physical science itself before we are much older in the world's history. We may well suspect the wisdom of the attempt to shut up physical science and religious science in separate apartments, with a declaration of non-intercourse between the two houses! It is better that even a crude and quarrelsome recognition of their honest relationship should exist than that, for the sake of a spurious peace, a false pretense should be set up of wholly unrelated and irresponsible independence. But this will take care of itself. Science *has* effected vast changes in theology; theology has effected vast changes in science! If anybody thinks the heliocentric theory of our planetary system has nothing to do with the enlargement of theologic notions, or the age of the earth and the race nothing to do with theological genesis, he is hardly to be reasoned with. But what have not the unity of God and the unity of the race as theological data done to prompt and guide the unity of science; and what have not scientific minds owed to the moral veracity of God and the theory of his sovereignty and beneficence, in their explorations into the physical laws of the universe? Religion led science across the ocean to discover America! Science led religion over the Atlantic to people New England. It is the love of truth and the confidence in its beneficence, learned in the school of religion, that makes modern science so conspicuous for candor, courage and humility. It is a profound religious instinct that makes its chief leaders feel that physical knowledge can never end the quest, or satisfy the longings and wants of the human soul; and I expect yet to see science on its knees, and theology looking with

unshamed eyes into all its disclosures — both in perfect amity and oneness of heart — before the century has concluded. Meanwhile, let us rejoice in the vigor with which a new civilization has inspired science. Humanity must not think lightly of any of the allies that fight in the army of her progress. There is but one end for all — it is the good of man, which is the glory of God, his maker! That beneficent Creator has no narrow or contracted scheme, and none of the elements in the life He has ordained is otherwise than precious in His eyes. Commerce, literature, science, art, even pleasure, are servants of His will. The great Commander gathers His battalions under many different colors; and sometimes it is the cavalry, some times the infantry, and sometimes the artillery that has the post of honor in the front. Nay, often, one arm in His service is called to wait until slower arms come up, before the advance can be made along the whole line. But He never loses a battle, nor suffers any one of His armies to betray the rest. Science seems just now in the van, but she is there in the common interest, and she will neither take nor hold the enemies' lines — ignorance, sin and poverty — without mingling her colors with all the rest. Let us not envy nor miscall her services, nor withhold our own, if we are ranked in a less immediately popular or a less conspicuous corps.

Finally, I congratulate you upon the social features of this new home; these ample and inviting parlors and the preparations for a festive interchange of minds and hearts in the presence of a high scientific study, and amid books of reference and atlases and charts and curiosities, stimulating to conversation and intellectual pleasures. Every such provision for the social wants of intellectual and studious men and women, in this strangely unsocial stage of our intellectual life in the capital city — whose society is mainly frivolous and external — is to be welcomed with applause. Excepting the artists, there is no class of persons, devoted to the higher culture of humanity, that here appear to have a coherent and mutually dependent life — of sympathy and co-operative feeling. Neither literature, poetry, philosophy, science nor theology have any successful social centers, where men engaged in those pursuits are sure to find fraternal sympathy and social relaxation with their peers. It is complained, I think with justice, that thinking men are isolated, unknown to each other, driven into solitude and an unproductive bachelorhood, by a certain unfavorableness to social intercourse which our commercial atmosphere produces. It is certain that a finer spirit exists in other American cities

than in our own, in this respect. It is true our clubs do some thing to obviate the difficulty, but they are expensive and heterogeneous. I trust that these rooms will call together and invite into friendly relations and social intercourse, upon a scientific ground, all young and thirsting geographers and scientists, and all those who find in the purlieus of science, relaxation from commercial and professional life. The Geographical Society could hardly do a better service than make science social, while others are making social science popular.

Excuse these unconsidered and spontaneous utterances from the heart, which, without preparation or adequate notice, I have ventured to make, to relieve the anxiety of your President, who would have occupied your attention so instructively as well as pleasurably, had his health been at all equal to his zeal and devotion to your interests.

At the close of the remarks of Dr. Bellows, the company assumed the character of a social gathering, viewing the various departments of the building, and partaking of refreshments furnished in the library.

RECEPTION, WEDNESDAY EVENING, NOVEMBER TWENTY-NINTH.

Hon. Manuel M. Peralta, Minister Resident of Costa Rica, read a paper on the "American Inter-Oceanic Canal," and Mr Alexander H. v. d. Horck, of Berlin, gave an account of his recent journey to the Spitzbergen seas and boat journey in Lapland.

The thanks of the Society were extended to both speakers, and a copy of their papers requested for publication.

Special meeting of the American Geographical Society, held at its rooms, No. 11 West Twenty-ninth street.

New York, *December* 22, 1876.

Chief-Justice Daly in the chair.

Chief-Justice Daly, the president, introduced Miss Russell, saying that America could but be deeply interested in the condition and prospects of sister republics in Southern Africa, of which it is so difficult to obtain any information, except through unfriendly sources. The Society desired to avail themselves of Miss Russell's presence in America to learn from the lips of a native of South Africa, of European parentage, something of the spirit and life of the people, and had, therefore, invited Miss Russell to address them upon "The

Republics of South Africa." At the conclusion of Miss Russell's address the Society gave her a vote of thanks, and requested a copy of her paper for publication.

Meeting of the American Geographical Society, held at Chickering Hall, corner Eighteenth street and Eighth avenue.

NEW YORK, Friday Evening, *December* 29, 1876.

Chief-Justice DALY in the chair.

On the recommendation of the Council the following named gentlemen were duly elected:

Fellows — Frank A. Hill, A. J. D. Wedemeyer, John B. Cornell, James Usher, W. J. Palmer, Eben Goodwin, Samuel N. Hyde, Lieut. Murray Simpson Day, U. S. Navy; William M. Hoes, John Brower, Frederick Billings, General William Striker, A. Augustus Low, Daniel J. Holden, J. L. Miller, J. B. T. Hatfield, Dr. Elisha Harris, F. H. T. Bellew, Charles Miehling, Henry E. Wrigley, Benj. L. Curtis, Jos. W. Drexel, Paul Tucker, Leopold Lindau, Hans G. A. Struve, Benj. R. Curtis, Lieut. Geo. Mansfield Totten, U. S. Navy; J. V. Henry Work, A. B. Stone, B. F. Dawson, M. D., John M. Jones, Dr. Morris Mattson, Rev. Roderick Terry.

Corresponding Members — Signor Don Manuel M. Peralta, minister resident of Costa Rica, at Washington; Lewis H. Morgan, Esq., Rochester, N. Y.

The amendment to chapter 5, section 2, offered at meeting held October 31, 1876, by Mr. F. A. Stout, was taken up and passed.

The president, upon motion, appointed the following gentlemen as the nominating committee to select suitable officers of the Society for the year 1877, viz.: James O. Smith, M. D. (chairman), Thomas C. Acton and Alex. J. Davis.

The speaker of the evening, Major J. W. Powell, in charge of the Geographical Survey of the Rocky Mountain Region, was introduced to the Society by the president, who delivered a "Discourse on the Philosophy of the North American Indians."

At the conclusion of Major Powell's discourse, a vote of thanks was given him and a copy of his paper requested for publication.

The meeting then adjourned.

ELIAL F. HALL,
Recording Secretary.

PART II.

PAPERS READ BEFORE THE SOCIETY.

NOTE. — THE AUTHORS ALONE ARE RESPONSIBLE FOR THE CONTENTS OF THEIR RESPECTIVE PAPERS.

ANNUAL ADDRESS.

By Chief-Justice Daly, LL.D., President of the Society.

THE GEOGRAPHICAL WORK OF THE WORLD IN 1876.

Shakespeare, in his prologue to the play of "Henry V.," in view of the historical events which are there depicted, asks pardon of his audience for bringing "so great an object" within the small space of the Globe Theater, reminding them that it could not hold "the vasty fields of France," nor could he cram within it the hosts that fought at Agincourt; and with much greater propriety should I apologize for attempting, within the compass of an hour, to give an account of the geographical work of the world, which is every year increasing in magnitude and in the wideness of its distribution.

I may begin by stating that the geographical feature of the past year has been the increased interest shown in the enlargement of geographical knowledge, not only by the investigations which have taken place, and the discoveries that have been made, but by the establishment of geographical societies in Amsterdam, Copenhagen, Marseilles, Lisbon, Madrid and Bucharest; by a large increase of members in the leading societies of England, France and Italy, and in the inauguration by the King of Belgium of an international organization, composed of prominent geographers, African explorers and the heads of the leading geographical societies, to carry on the work of exploring and civilizing the interior of Africa upon a systematic plan — a movement of great interest, and which in all probability will lead to very important results.

In the opening part of my address last year I gave a brief account of the rise of geographical societies, and of what had been effected since their institution. I then supposed that they originated with the formation of the Societé de Geographie of Paris in 1821; but I find, in a paper by Mr. V. A. Malte Brun, that a cosmographical society (Society of the Argonauts) was founded in Venice as early as 1688; and that a few years later an association of the same kind was

established in Nuremburg; so that we have the interesting fact that geographical societies, of which there are now thirty-eight throughout the world, originated 188 years ago.

PHYSICAL GEOGRAPHY.

In an account of the geographical work of the last year, our attention should first be given to those investigations which relate to the world in general, as contradistinguished from those which relate to particular parts of it, under which head I shall first refer to physical geography, a line of inquiry in which there has been great activity during the year. This is shown by the number of valuable works relating to it that have been published, by the papers that have been read, and the discussions which have taken place upon various branches of this great subject before geographical and other scientific societies in different parts of the world.

At a meeting of the British Association at Glasgow, last September, Sir Wm. Thompson considered the subject of the interior of the earth. He said that the greatest depth that had been reached in observations of underground temperature was scarcely one kilometre (which is less than a mile); that whatever might be the age of the earth, we might be sure that it was solid in the interior — not through its whole volume, as there were spaces in volcanic regions occupied by liquid lava, but that this portion was small in comparison to the whole, and that any geological hypothesis must be rejected which assumes that the earth is a shell resting on a liquid mass. He also considered the question, first, of the accuracy of the earth as a time-keeper, and second, the permanence of its axes of rotation. He said that since the first known observation of an eclipse of the moon at Babylon, on the nineteenth of March, 721 B. C., the earth has lost a portion of its velocity, and is now, as a time-keeper, going slower.

His observation upon the question of the earth's axis was, in effect, that if causes existed adequate to produce a change in the position of the axis by the upheaving of the surface or otherwise, the result, even if sudden, would not be very great, or produce any extraordinary effect. Many important observations were made, at the same meeting, upon the tides and upon ocean temperature and currents, founded upon the results of the voyage of the Challenger, and an admirable address was delivered by Capt. R. S. Evans, R. N., upon the physical geography of the sea, to many things in which I would willingly refer but for my circumscribed limits.

The "Challenger."

Sir Wyville Thompson has given the general results of the expedition of the Challenger, and I shall abridge a statement of them, as far as possible, in Sir Wyville Thompson's words. The superficial area, he says, of this world of ours is 197,000,000 of square miles, of which 140,000,000 are covered by the sea at an average depth of 15,000 feet. This region, which, until recently, excited little curiosity, and which seemed to be practically inaccessible, we now know is, to a certain degree, comparable to the land. It has its hills, valleys and great undulatory plains; its various soils of widely diffused materials; it has its climates, whatever the exceptional condition of these climates may be, and its special races of inhabitants, which depend, like the inhabitants of the earth, upon the condition of climate and on the nature of the soil for their distribution. The object, he continues, of the expedition was to investigate the physical and biological condition of the great ocean basin. The vessel departed from England in December, 1872. She crossed the Atlantic four times in 1873, in a course of nearly 20,000 miles. In 1874 she went southwards from the Cape of Good Hope, dipping within the Antarctic circle as far as she could, and then traversed the Australian and New Zealand seas and the interior of the Malay archipelago, arriving at Hong Kong on November 10, 1874, after a run, in that year, of 17,000 miles. In 1875 she traversed the Pacific, in a course of about 20,000 miles, and then crossed the Atlantic for the fifth time, reaching England May 24, 1876. He then states the three general results: 1. The knowledge obtained of the contour of the bottom and the nature of the deposits now being formed. 2. The distribution of deep sea climate. 3. The nature and distribution of the peculiar race of animals now found at the bottom of the sea. In the Pacific there is an enormous extension of water of great depth, in many cases beyond 18,000 feet. In the North Atlantic the greater portion has a depth of 12,000 feet; and in the South Atlantic, on each side of what is known as the Dolphin rise, there are troughs usually 18,000 feet deep, which formed marked depressions roughly parallel with the arc of the South American and African continents. The whole bottom of the sea is gradually receiving accumulations, giving rise to formations which must be regarded as the rocks of the future. The debris of the land was found to be carried out into the sea some hundreds of miles, and clays were being formed mixed up with the debris of animals. Within a certain distance of the

land the deposits, to a great extent, were of this material. Over a great part of the North Atlantic there is being deposited the *Globigerina* ooze, composed principally of small chambered shells, extremely minute, and these shells were found in enormous quantities. This deposit is almost entirely of carbonate of lime, and the only rock it could form would be limestone. Therefore, over a large part of the North Atlantic, and over many other parts of the world, this limestone is being laid down. As this modern chalk was brought up the question arose, where did these creatures live — on the bottom or on the surface? The general impression was that they lived at the bottom, where the dead shells were found, but upon investigation the conclusion arrived at was that they lived on the surface and a little below it, and that the whole material of the bottom, composed of these shells, is derived from the surface. The shell has a little animal in it, a particle of gelatinous matter like the white of an egg, and when alive this matter runs out of the holes of the shell to the end of the spines, where it absorbs minute particles of organic matter floating on the surface. It might be supposed that this formation ought to be as universal as is the distribution of these animals on the surface. Singularly enough this is not the case. At the depth of 12,000 feet the shells become rotten and yellow; at 13,000 feet there are no shells, but the bottom is one of homogeneous red mud, which, instead of consisting of carbonate of lime, is ordinary clay, the carbonate of lime being in some way removed from the shells of these creatures. I may here interpolate a fact to show how abundant animal life is at or very near the surface of the ocean. The steamer Great Eastern was lately in dock at Milford Haven for the examination of her bottom, which had not been scraped since 1867. Her bottom was found covered with an enormous multitude of mussels, clustered together in one dense and continuous deposit, extending over 52,000 square feet, and which, upon a calculation made, amounted to not less than *three hundred tons* weight, or enough to load with a full cargo two ordinary collier brigs.

A curious fact observed in the voyage of the Challenger was that all over the bottom of the sea there is a large quantity of pumice, showing that there are volcanoes, either below the water or otherwise, that are constantly throwing out material from the crust of the earth. This pumice, which is the froth of lava, is frequently so light as to float on the water, and wherever they were, in any part of the world, they saw it moved about by the current over the surface of the

sea. They found living in the sea, on the surface or just below, a great quantity of beautiful organisms called *Radiolaria.* They increase with the depth, and many occur at great depths that are not found on the surface at all. The impression formed was that they lived all through the sea, and down to the greatest depths.

The whole bottom of the Pacific, or the greater part of it, is red clay. The temperature of the ocean at 13,000 feet is very low. It is usually but a little above the freezing point at the bottom of the Pacific and the Atlantic, and portions of the Southern sea. The general temperature gradually falls from the surface until the depth of 13,000 feet, below which there is, throughout the sea, a uniform temperature of 37° or 34°, or a little below the freezing point. The question arose, whence does the ocean derive this low and uniform temperature? It is a question of great difficulty, and the conjecture made is that it is an inflow of the cold water from the vast area of the Antarctic.

In respect to animal life, the deep sea, so far from being barren, has a fauna remarkably constituted, comparatively rich, and universally distributed to the greatest depths. It was supposed to be analogous to the ancient chalk, but upon examination this was found not to be the case, except in a few instances. The fauna of the deep sea is wonderfully uniform throughout, and many of the formations are delicately intricate and exquisitely beautiful.

Meteorological and magnetic observations have been carried on extensively during the year, but any account of them would involve an amount of detail too great for this address.

Terrestrial Disturbances.

Every year denotes how active and continuous are those disturbances that affect the earth's surface, and it is only since we have begun to note them from year to year, as they occur over the whole extent of the globe, that we have been able to form some adequate conception of the effects which such disturbances, operating over vast periods of time, have had upon the earth's surface.

Earthquakes during the year have been numerous and widely distributed, and there have been destructive floods in Europe and very disastrous cyclones in Asia. A cyclone swept over the island of Reunion, in the Indian ocean, an island about fifty miles long by about thirty wide, and damaged every part of it, and a cyclone wave unexampled in its injurious effects swept over the low-lying district

at the mouth of the Ganges, at midnight, on the thirty-first of last October, by which, according to the London Times, 215,000 persons lost their lives, which is believed to be rather below than above the real estimate.

What changes may be effected by the slow but continuous operation of other causes may be illustrated by the island of Heligoland, at the mouth of the River Elbe. In the ninth century this island was 120 miles in extent, in the fourteenth century it was reduced to forty-five miles, in the middle of the seventeenth century to four miles, and it is now less than one mile in superficial extent. This has been effected by the action of the sea from the north-east; that is, by the set of the current and the prevailing winds; the island having lost only one mile from the opposite direction from the earliest records.

THE ORAL TELEGRAPH.

As pertaining to the earth in general, I may mention an extraordinary invention in connection with the telegraph. The wonder of Gray's electro-telephone, sending four messages at once, and capable with certain improvements of doing four times as much, has been surpassed by the invention by Mr. Graham Bell, a young Scotchman residing in Boston, by which a message is transmitted orally. A person at one end of the wire delivers the message by word of mouth, and a person at the other, by applying his ear, hears the words that are uttered. Sir Wm. Thompson, the very highest authority on such a subject, considers this invention one of the marvels of our age, he having himself tested it during his recent visit to the Centennial.

THE ANTIQUITY OF MAN.

The subject of the antiquity of man is one upon which light is constantly shed by new discoveries and investigations.

The combined labor of Messrs. Whitney, Dawkins, Tiddeman, Croll, Skertchley and Geikie have added to the conviction that man existed during the glacial epoch; that that period was not an uninterrupted one of cold, there being at least four ice ages, with intervening cold and warm periods, and that during these periods as indicated by the remains found, man was an inhabitant of our planet, with animals either now extinct or only found in warm latitudes; whilst Professor Hughes, on the contrary, maintains that the evidence relied upon to show the existence of man during the glacial period is far from satisfactory. "Twenty years ago," says Mr. A. R. Wallace, "the antiquity of man as now understood was universally discredited. Geologists as well as

theologians thought that the earth assumed its present condition before the human race appeared upon it. Since then so many discoveries have been made in all parts of the globe that we can hardly wonder at the revolution effected in public opinion. Not only is the belief in man's vast and still unknown antiquity universal among men of science, but it is hardly disputed by any well-informed theologian." He further adds that, "up to the appearance of Mr. Darwin's work in 1859, the belief in the independent creation or origin of the species of animals and plants, and the very recent appearance of man upon the earth, was practically universal. The development of man from some lower animal form is still to some extent disputed," but this controversy he declares to be nearly at an end, since Professor Mivart, the anatomist, and one of the most talented representatives of Catholic theology, adopts it, as regards man's physical structure. "Never, perhaps," he continues, "in the whole history of science and philosophy, has so great a revolution in thought and opinion been effected in so short a time. It has been so great that facts opposed to this conclusion hardly receive their due consideration," amongst which is the fact, that if man be a development from the lower animals, he must be immeasurably older than any traces of him that have yet been discovered, and many other points, to which I have not space to refer.

Whilst upon this subject I may mention that an archæological explorer in Africa calls attention, in a recent letter to an English journal, to the remarkable fact that the earliest known remains of Egyptian art are as good as any of those which follow, and that no inferior remains are found which show any gradation from bad to better, or from better to good; that a recently found statue of a young man and his wife, of a very remote period, in the fineness of the work, equals anything discovered. He pertinently asks the question: If previous inferior works existed where are they?

And as bearing upon this subject and the changes that have occurred since the glacial period, I may state that, in a recent examination of the contents of the stomachs of mammoths found in Siberia, the conclusion arrived at was that these animals lived where their remains have been found, and fed upon plants still existing in Siberia; one of the numerous previous theories being that these animals, which now exist only in very warm climates, were brought down to the Arctic by the great northern Asiatic rivers, near which, or in which, they are found imbedded in the ice.

ARCHÆOLOGY.

Archæological researches, where they relate to the sites of ancient cities, and trace their topography, come within the department of ancient geography. Investigations of this nature have, during the past year, been active, and attended with very interesting results. Mr. E. T. Wood, who spent eleven years in exploring the site of the city of Ephesus, contending with fevers and marauding brigands, and working in pits and trenches almost constantly under water, has, during the year, published a full account of his labors. The German archæologists, Drs. Hirschfeld, Weil, and Mr. Bötticher, have been engaged during the year in making excavations at Olympia, in Greece, which besides clearing the ruins of the temple and laying bare its marble pavements, has led to the discovery of numerous inscriptions, sculptures and other objects of interest. The site of the celebrated temple, which for centuries was a dreary waste, has now, in consequence of these discoveries, become a resort for tourists. Mr. L. P. di Cesnola, who has been absent for three years, continuing his researches in Cyprus, ended his labors last autumn, and is now upon his return to this city. He has discovered the site of Curium, mentioned by Strabo, of which no trace existed. He thought, from the appearance of the ruins, that the city had been destroyed by some convulsion of the earth. He came across a mosaic pavement having columns upon it, and upon removing them discovered a subterranean passage leading to chambers filled with earth, which he first supposed to be tombs, but which ultimately proved to be the treasure chambers of a temple. He explored four of these rooms or chambers. In the first, upon removing the earth, numerous gold ornaments were found; in the second all the objects found were of silver, consisting of vases, bowls, armlets, rings, etc.; in the third were vases, statuettes, etc.; and in another every object found was of bronze, copper or iron. They were evidently the votive offerings of devotees, which were kept in these apartments by the priests. He also explored the ruins of Amathus, one of the oldest Phœnician cities in Cyprus, and brought away from it a fine marble sarcophagus, sculptured in high relief with a colossal female head in the archaic Greek style. He identified the great temple of Apollo Hylates, and says that his last three years' excavations have surpassed that of the seven preceding years. Dr. Schlieman has followed up his excavations upon the supposed site of ancient Troy by excavations upon the site of Mycenæ. Mycenæ is the most ancient

city in Greece. It is identified with the poems and personages of Homer, and Dr. Schliemann supposes that he has found the tombs of Agamemnon, Clytemnestra and other Homeric personages. Whether he has or not, he has found and opened tombs which, from their cyclopean structure, belong to a very early period of Greek civilization. His excavations, which have been extensive, disclose the general topography of this very ancient and wealthy city, the monumental and other remains of which he carries back to 1200 B. C., the period to which the Homeric poems are usually ascribed. The articles discovered in the tombs and other places are far more extensive, varied, and of greater archæological value, than those dug up by him upon the supposed site of Troy. They show that glass and iron were in use amongst the inhabitants of this city in very remote times. Two keys and two daggers of iron were found, the keys being of very curious workmanship. Near the Gate of the Lions, in the Acropolis, beneath the ruins of a building, a labyrinth of cyclopean walls, forming many passages, was found. A ring of white onyx, with an intaglio representing animals, was discovered, which, though of very ancient workmanship, is said to be a masterpiece of art. The anatomy of the animals is especially dwelt upon, and the wonder expressed how such a work was possible without the aid of a microscope. Many of the figures painted upon the vases are of Egyptian and Assyrian types, and some have the long Assyrian beards with which we have become so familiar through the sculptured tablets excavated at Nineveh. A remarkable discovery in the tombs was made of two skeletons covered with about five kilogrammes (eleven pounds avoirdupois) of pure gold, with the most wonderful archaic impressed ornaments. "In respect to the human remains discovered," Dr. Schlieman says, "the bones which I found are like the bones of giants of extraordinary size, and the teeth are very large." Numerous articles in gold and silver, some of them very valuable and of exquisite workmanship, are among the treasures discovered, showing that at that early period these metals were skillfully worked. Only three inscriptions were found, which the Rev. A. H. Sayce, of Oxford, one of the highest authorities, was unable to decipher.

Mr. W. E. Robertson recently visited the site of ancient Carthage. A mile or two from the Tunis railroad he came upon the foundation of a wall three feet broad, and following it for three miles reached plowed ground covered with broken marble columns and heaps of ruins crumbling to decay. These fragments, with the

remains of reservoirs and the aqueduct, which was constructed of enormous blocks of stone on a scale of great magnificence, is all that now exists of the city of Hannibal. The lovely situation of the city, he says — standing on a prominent headland, against which the waves of the Mediterranean beat — captivated those who ultimately became its conquerors, and accounts for the site of the present city of Tunis, in a situation where it is less accessible to foreign invasion. A Mr. Laurie has also visited these ruins during the year. He says that nothing has been done in the way of excavation, except by the French on the site of the Temple of Æsculapius, to the depth of twenty-five feet, and that, in his opinion, a great deal may yet be done by excavations.

In giving an account of geographical labors in different parts of the world, I shall begin with what has been done in our own country.

UNITED STATES.

The surveys, explorations and other governmental work of the United States of a geographical character have been more limited than usual this year, from the late period when the requisite appropriations were passed by Congress, as well as from the smallness of the amount allowed in certain departments. The principal reports have not yet been printed, but I am able to give a brief statement of what has been done upon information courteously communicated to the Society by the various departments at Washington.

THE COAST SURVEY.

In the Gulf of Mexico, careful soundings and observations upon the temperature of the water and the flow of the currents were made by the coast survey, which will throw much light upon the course of the Gulf stream. The trans-continental triangulation was pushed eastward from the Pacific coast ranges to the Sierra Nevada, some of the triangles observed having sides of over 150 miles long. The explorations in Alaska, I regret to say, were not continued, in consequence of the smallness of the appropriation allowed for the survey this year.

HYDROGRAPHIC BUREAU.

Lieutenant Commander Green, of the Hydrographic Bureau, has made a most valuable series of telegraphic determinations of longitude, for the purpose of correcting our charts of the West India Islands, one point, at least, having been accurately located on each island.

United States Engineer Corps.

The survey of the lakes by the United States Engineer Corps has been carried on by Gen. C. B. Comstock. The excellent triangulation along Lakes Ontario, Erie and Michigan has been continued, the topography of the Niagara river completed, and many points determined for the State survey of Michigan. One of the most interesting results of the survey is a new determination of the elevation of the great lakes. They find Lake Ontario to be 247.25 feet, and Lake Erie 573.58 feet above mean tide at New York, which corresponds almost exactly with the results reached by Mr. Jas. T. Gardner, three years ago, by a different method. The improvement of the South Pass of the mouth of the Mississippi river, according to the plans of Capt. Eads, C. E., for the construction of jetties and other auxiliary works, has also been carried on; but I am unable to gather from such reports as I have seen if the present progress of the work indicates whether it will or not, when completed, be sufficiently permanent and effective to maintain, for all future time, the improved channel.

Col. Wm. A. Ludlow's report of his reconnoissance from Carroll, Montana, to the Yellowstone National Park, has been published. It embraces a description of the remarkable cañons, the geysers, the best routes of travel, geographical positions, and other interesting information respecting the natural history and geology of the region. Lieut. E. H. Ruffner's valuable report on lines of communication between Southern Colorado and Northern New Mexico has also been published by the chief of engineers, together with a sketch by Lieut. Mallory of a topographical reconnoissance in Arizona, as well as an account of the work of the engineers attached to the columns of Gens. Terry and Crook, written by the officers in the field, and the geological and geographical explorations under Mr. Clarence King, is about to be issued.

Lieut. Wheeler's Expedition.

The geographical explorations and surveys under Lieut. Wheeler, west of the 100th meridian, have been continued. The corps went late in the field. They were distributed into several parties, and their explorations and surveys were carried on in Nevada, New Mexico and California. About 25,000 square miles were traversed by the different parties during the season, about 9,000 square miles of which were in New Mexico, south-east of Santa Fe. It is a region of elevated table-lands, mostly adapted for grazing purposes, about six per cent being covered with timber. Before the party making this

survey left the field the mercury fell to 16½° below zero, a low temperature for that region. Some interesting Spanish mines were found by them.

Another party made a plain table survey of Virginia City, in Nevada, and the map of it, on the scale of 500 feet to the inch, is in progress. Another portion of the Nevada section surveyed about 6,000 square miles in the central part of the Carson desert and the regions east of it. A survey was also carried on in the neighborhood of Lake Tahoe, in California. The depth of Lake Tahoe was found to exceed 2,200 feet. This party report that the magnificent forests of the Sierra Nevada, in that neighborhood, are being felled so rapidly to supply timber for the miners that in twelve years there will be no timber left for many miles.

Lieutenant Bergland completed the examination of the Colorado river, with reference to determining the practicability of diverting it from its channel to irrigate the deserts of south-eastern California, a project to which I have so frequently referred. The lowest part of this desert, the Coahuila valley, is 200 feet below the sea. It was found that south of the United States boundary, in Mexican territory, a canal from the river westward of this valley is practicable, and would flood an area of 1,600 square miles; but constantly shifting sands would make it a continual expense, and the water flowing in the Colorado river in the dry season is not as much as would evaporate from the surface of such a lake. There is no doubt, however, that when a dense population warrants such an expensive undertaking, that a large part of the Coahuila valley might be irrigated and made productive thirty miles south of the United States boundary. Lieutenant Bergland examined a group of miniature mud volcanoes in active eruption, throwing up liquid mud and emitting sulphurous vapors.

Thirteen atlas sheets of Lieutenant Wheeler's survey have been issued, and six more will soon be ready. They are upon a scale of eight miles to the inch, and cover a large part of Nevada, Utah, Arizona, New Mexico and Colorado.

Professor Hayden's Expedition.

The United States Geological and Geographical Survey of the Territories, under Professors Hayden and Powell, was carried on. Professor Hayden did not take the field until August. Mr. A. D. Wilson's triangulation party traveled nearly 2,000 miles, making a com-

plete circuit of the new and great mountain State of Colorado; but the remaining parties confined their labors to the sandstone plateau region, lying between the granitic ridges of the rocky chain and the great Colorado river, whose upper course is called the Green river. A few rivers, draining the western slope of the Rocky chain in these latitudes, run westward to the Green river, cutting deeper and deeper cañons into the horizontally bedded rocks as they approach their mouths. Between these rivers are lofty, waterless table-lands, intersected with gorges and cliffs almost impassable. A few stunted trees on the higher parts hardly relieve the ashen hue of this verdureless waste, while the gigantic monuments and figures into which the cliffs are often worn, add to the effect of the mysterious fissures. Large veins and springs of asphaltum, and great deposits of coal of an inferior quality were found, but no traces of "the cliff-building people" were discovered on these plateaus north of latitude 37° 45′.

Wilson's party, before referred to, climbed and measured Blanco Peak, near Fort Garland, in Colorado, which is the highest peak in the Rocky mountains. It is 14,464 feet high. The most elevated peaks of the Rocky mountains are in the State of Colorado, but as there are over fifty that range from 14,000 to 14,500 feet, it has required much examination and care to determine which is the highest.*

To scale these lofty heights is a task of great difficulty, and the ascent of Blanco Peak by Wilson's party was, in view of the peril encountered and the obstacles overcome, a remarkable achievement in mountain climbing. After many and severe trials they reached the summit, when one of the most magnificent views in all Colorado was spread out before them, the greater portion of Colorado and of New Mexico being embraced in the field of vision.

Owing to the lateness of the appropriation, this branch of survey was confined in its labors chiefly to the completion of the Atlas of Colorado, a work upon which they have been engaged since 1873. Six sheets of the Physical Atlas will be issued within the next few months, each embracing 11,500 square miles, or a total of 70,000 square miles.

* NOTE. — How near in height the principal peaks are will appear from the following statement: Blanco Peak, 14,464 feet; Mount Harvard, 14,384 feet; Gray's Peak, 14,341 feet; Mount Lincoln, 14,286 feet; Mount Wilson, 14,280 feet; Long's Peak, 14,271 feet; Uncompahgre, 14,235 feet; Pike's Peak, 14,146 feet.

PROFESSOR POWELL'S EXPEDITION.

The main corps of Professor Powell did not leave Washington until early in August. They proceeded to the town of Gunnison, in Utah, and there organized six field parties, under the direction of Professor Thompson — three geographical, two geological and one photographic.

Eastern Utah was surveyed from the Colorado river to the Wasatch mountains, and over these mountains, between parallels 38° and 39° 15′.

The characteristic of the region surveyed is great plateaus, with lines of cliffs bounding them, which are from 1,000 to 2,000 feet high, and which vary from twenty to 200 miles long; the whole region being intersected with a net-work of deep, narrow cañons, with vertical walls, that present nearly impassable barriers to travel. The only streams are in the bottom of these cañons. Land capable of irrigation, in any considerable body, is to be found only along the valleys of the Green and San Rafael rivers. Agriculture is impossible without irrigation; and of the 7,000 square miles surveyed, about four per cent only can be irrigated, and but one per cent made available, without a large outlay of capital for dams and canals. A scanty growth of pine and spruce covers about five per cent of the area, the remaining lands being a desert waste. There are large quantities of excellent coal, but no precious metals were discovered. The average elevation of the region is about 7,000 feet, and the highest peak — Mount Ellen, in the Henry mountains — is 11,500 feet. Snow fell early in October, and the surveying party in the latter part of the month forced their way through it with difficulty.

Another party surveyed about 4,000 square miles in south-western Utah and south-eastern Nevada, one of the most rugged and barren regions in the whole of the great basin. It is not, like eastern Utah, a country of plateaus, but is marked north and south by ranges rising to 9,000 feet, with broad desert valleys between. No considerable bodies of timber lands, or lands capable of irrigation, were found, and only the small proportion of half of one per cent possesses any value, either for agricultural purposes or woodlands. Part of the remaining lands afford pasturage, but it is of the poorest quality. The climate is very dry; the annual rainfall does not exceed four inches; and although the average elevation is about 5,000 feet, the climate is much milder than that of eastern Utah. The surveying party remained until the middle of December without encountering

any snow storms. There is no coal in this region, but it is known to contain large amounts of silver. The well-developed mining district of Pioche was within the region examined, and also a newly organized district of Leeds, in the Virgin river, Utah, where silver, instead of occurring in veins, is disseminated, in the form of horn-silver, through a stratum of sandstone belonging to the Jura Trias. Between 4,000 and 5,000 men have gathered at this last named district (Leeds) within the past few months.

The entire area of 11,000 square miles was visited by the geological and triangulation parties.

During the greater part of last winter, and in the spring, J. K. Hillers, the photographer, and O. D. Wheeler, C. E., were in the province of Tusayan, in northern Arizona, one of the towns of which is known as Moqui. They made plans of the villages on a large scale, and took a number of photographs of important and striking localities, and of objects connected with the industry and arts of the people. The people of Tusayan are the best preserved remnant of the Pueblo race, the ruins of which race cover Arizona, New Mexico, Colorado and Utah, and extend beyond these territories north and west. No trace of any metal was found, except such as had been introduced by the whites. The native arts are more highly developed here, and more varied, than among any other family of tribes north of Mexico; and neither in their architecture nor in the domestic arts is there any indication of their having degenerated from a more advanced state.

The collections made embraced totemic carvings and paintings, pottery, stone implements, clothing, ornaments, food, furniture and manufactures.

SMITHSONIAN INSTITUTION.

Under the direction of this institution, Judge J. G. Swan, of Portland, Oregon, has made a very interesting collection, illustrating the arts and industries of the Indian tribes, both of western Oregon and Washington Territory. Among the objects obtained are carved and painted wooden columns, varying from twenty-five to forty feet in height. The devices which are carved or painted upon them represent the totemic history of the ancestors of the chiefs. These columns, of which there were specimens at the Centennial Exhibition at Philadelphia, have hitherto been supposed to be idols, but they are now known to be heraldic — an interesting fact, showing the perfection reached in heraldic devices among people living in the savage state on the shores of the Pacific. The tribes who erect these heraldic

columns live upon the mainland, east of Vancouver's Island. They inhabit communal dwellings holding from 100 to 300 people, and these totemic or heraldic columns are erected in front of the dwellings. They make their house of slabs split, or, more properly, riven out of great tree-trunks with wooden wedges and stone mallets. Judge Swan also obtained canoes sixty feet in length, dug out from single logs.

INDIAN REMAINS.

On the islands along the southern coast of California Mr. Schumacher collected, for the national musuem at Washington, many tons of ancient stone implements and domestic utensils, as well as pottery. They are remarkable as exhibiting an amount of skill and taste beyond any thing of a like character that has been found in North America. The collection embraces vases, jars, bowls, pitchers and mortars of stone, stone knives, lances and arrow-heads of exquisite workmanship. The stone instruments, it is thought, surpass in beauty of finish any aboriginal remains of a like nature heretofore discovered in any part of the world. They were found in graves that date from before the arrival of Europeans and up to a very remote period.

Under the direction of Prof. J. W. Powell, Mr. S. Powers traveled through California, making vocabularies and collections for the national museum at Washington, to illustrate the languages, arts and industries of the multitudinous tribes of that region. Besides many other interesting things, he secured over twenty models of Indian dwellings and their appurtenances, together with plans of Indian villages. A very interesting feature is a collection of the foods used by these tribes prior to the arrival of the whites. It also embraces implements of war, hunting, trapping, clothing and ornaments.

UNITED STATES LAND OFFICE.

The land office has published a valuable atlas of the Western States and Territories, based upon the rectangular surveys and boundary determinations executed under the direction of this department, and also a new edition of the large wall map of the United States.

UNITED STATES SIGNAL SERVICE.

This corps, under the able direction of Gen. Albert J. Myer, is making rapid advances toward a complete knowledge of the conditions and causes of the American climate. They have nearly com-

pleted the most extensive collection of altitudes of places in North America which has ever been gathered. The list includes several thousand profiles, representing almost every railroad and canal, and from this and other data they are making a relief model of North America on a large scale. A telegraph line has been built by them from Central Texas across the Llano Estacado, that dreaded waterless desert, and one across the high and arid plateaus and ranges of Southern New Mexico and Arizona to San Diego, on the Pacific. This gives an unbroken line from Savannah along the southern border of the United States, stretching from ocean to ocean. Thirty meteorological stations are placed along the line, the highest being 6,800 feet above the sea. Another line of stations follows the Rio Grande river from its mouth to the elevated plateau of Colorado.

The Mexican telegraph lines now extend from the mouth of the Rio Grande river to San Luis, thence to Tampico, and thence through Vera Cruz along the coast nearly to the extremity of Yucatan, and the signal service are preparing to place stations down even to Yucatan. The Gulf of Mexico has been nearly encircled with a telegraph line, along which meteorological stations will be placed at such short intervals that no hurricane or storm can move from the gulf without notice of its escape and the direction of its flight being given at once to the whole country.

Arrangements have been made for a chain of stations to the extreme eastern end of the West Indies, all connected by telegraph with the Washington office. If Congress is wise enough to give sufficient appropriations to carry out these excellent plans, it will be impossible for any hurricane to enter the United States from the south unheralded, for hourly bulletins of its progress can be posted in every seaport. Who can estimate the lives and treasure that such an arrangement may save? Congress cannot be too generous to the signal service.

To show the power of the telegraph in this connection, I may mention that Gen. Myer recently sent, at 12 o'clock at night, an order to each meteorological station in this country. It was unexpected by the corps, but so perfect is the discipline, that within ninety minutes the Washington office received answers from every station, even including those on the lofty elevation of Pikes' Peak and the lonely desert of Fort Yuma.

At Gen. Meyer's suggestion, an international meteorological organi-

zation was effected in 1873. Observations are now taken once a day, *simultaneously*, at every meteorological station in the world, and the results forwarded to the signal service office at Washington.

Every day this office publishes a bulletin, giving the record of these simultaneous observations from all stations. The date of the bulletin is necessarily long enough after the observations to admit of their reaching Washington. The climate of the world is thus placed under our eyes at once, and when this is carried to perfection, the laws that govern climate may be determined.

PETRIFIED FOREST IN NEVADA.

Mr. D. Rideau has examined a petrified forest in the desert of north-western Humboldt, in Nevada. He found the stumps of the trees now transformed into rock, in an upright position, with their roots imbedded in the soil as when growing — many of the stumps measuring from fifteen to twenty feet in circumference; and found the ground strewn with trunks and limbs in the same petrified state, retaining their natural shape and size. There were no living trees, nor any trace of vegetation in the vicinity, except a growth of stunted sage brush.

The largest tree yet found in California was discovered during the year in Kings River Valley, Fresno county. Measured from the highest point to which a man could reach, it was found to be 150 feet in circumference, within a few inches, and its height was estimated at 160 feet.*

BRITISH AMERICA.

The boundary line between the United States and Great Britain, from the Lake of the Woods to the Rocky mountains, was established by treaty in 1818; but as difficulties arose from the establishment of British trading posts at points claimed by the United States to be within our line, an international commission for the survey of the exact line was agreed upon by both governments, which commission commenced its labors in 1872. Capt. J. Anderson, R. E., has, during the year, given an interesting account to the Royal Geographical Society of the result of their labors. The country between the Lake of the Woods and Red river was surveyed in the winter of 1872–3. It was a *terra incognita*, hitherto unexplored by white men, and was

* The statement of the height is probably a mistake, for the *Sequoia gigantea* of California runs from 275 to 350 feet in height.

found, as the Indians represented it, to consist mainly of swamps, making the work of the survey a very difficult one, which had to be conducted chiefly in the winter, when the swamps were frozen, and with the thermometer at 45° below zero. It was an arduous task, and the observer would occasionally find his eye-lid frozen to the eye-piece of his instrument. The least wind caused great suffering, and on the march the eye-lids of the men would often be frozen together. Of the country west of the Red river little was previously known. In every direction the old paths of the buffalo were seen, with their remains scattered about, showing it to have been once a region where vast numbers of them grazed, but during the last sixteen years they have been driven back 200 miles to the westward. It would be still a fine grazing ground, he says, were it not for the myriads of mosquitoes, which drive domestic animals almost wild and keep the strong ones from gaining flesh. In one direction the boundary line, in the course of thirty-five miles, crossed sixty-five pieces of water, twenty-five of which were lakes, requiring a survey by triangulation. In 1873 the survey was carried on to Turtle mountain, a district, Capt. Anderson says, invaluable to settlers. Beyond this it was extended over the Great Plains for 138 miles. The constant mirage on these plains caused great delay, for in looking through the telescope at a distant flag-staff, it would dance with persistent contortions. The general level is not disturbed for 120 miles west of Turtle mountain. By October of 1873, 400 miles of the boundary were surveyed, embracing the great coteau of the Missouri, the salt lakes and the arid and desolate country known under the familiar name of Le Mauvais Terre. During the summer of 1873 the great plains were swept by fire, and the explorers exposed to much peril. They were also involved in the great snow storm of 1873, which continued uninterruptedly for several days, and by which so many lives in the west were lost.

In 1874 the survey was carried to the Three Buttes, a mountain range with peaks 6,800 feet high, and from there to the base of the Rocky mountains, where these mountains rise abruptly from the plain in precipitous peaks 10,000 feet high. The whole boundary from the Lake of the Woods to this point, is now marked by stone cairns or earthen mounds; and by iron pillars, at intervals of a mile, for 135 miles along, and marking the boundary of Manitoba, in British America, which Capt. Anderson says "is destined to become the great granary of the dominion, from its enormous agricultural capabili-

ties." There are, however, the drawbacks of the want of market, the ravages of the grasshoppers and the scarcity of fuel. The latter difficulty can be obviated by the planting of trees and by developing the great bituminous coal fields of the Saskatchawan; and although the grasshopper has prevailed for the last four years, it was not found in the region for thirty-six years previously. Emigration in this direction is steadily going on; 4,000 Menonites from Odessa, in Russia, have settled there, and also a colony of 300 Icelanders on the western shores of Lake Winnipeg, who are well-satisfied with their new home.

ARCTIC.

The Arctic event of the year has been the return of the English expedition, the Alert and the Discovery, under Sir George Nares, from the attempt to penetrate the Pole by the way of Smith's sound. To a voyage like this, the details of which, in the report of Sir George Nares, occupy forty-five columns of an English journal, I can refer only in the most general manner. The vessels had great difficulty in forcing their way through Smith's sound and Kennedy's and Robeson channels. It required the greatest care, incessant watchfulness and the most skillful seamanship. The Polaris, in Hall's expedition, sailed with little or no obstruction from ice, up to 82° 16′ north latitude, where her further progress was impeded by heavy ice floes. The Alert and the Discovery, on the contrary, were twenty-five days making their way from Cape Sabine to Discovery bay, a distance of only 250 miles, during which time both vessels narrowly escaped being nipped, to say nothing of other hairbreadth escapes, and they were about twenty-five days upon their return in making the same distance.

Regarded from a geographical and scientific point of view, the expedition was a success. I said in my annual address several years ago that to reach the Pole was not the main object in an Arctic expedition; that that was a mere geographical feature, to which necessarily great *éclat* would be attached; but that the real object of such an expedition was to explore the Arctic region in every direction; as far as possible to obtain scientific information in a quarter of the globe where it was of the highest interest, not only as respects the past physical history of the earth, but to enable us to unravel phenomena and obtain a knowledge of physical laws affecting its present condition which are of high scientific value, or, to express it in a popular form, of the greatest practical importance. This object has been

to a considerable degree advanced by the English expedition. The Alert not only attained the highest latitude, 82° 24′, ever reached by a vessel, and the sledge expedition under Commander Markham the farthest northern point attained by man, 83° 20′ 26″ N. lat.; but the expedition, in an unknown region, discovered and traced a line of coast extending over nearly 38° of longitude, ascertained to a considerable extent the nature of the Polar sea bordering this newly discovered coast, and collected a large amount of scientific information in the examination of both land and sea. Commander Aldridge explored a line of coast for 230 miles west of the spot where the Alert wintered, ninety miles of which trends north-westerly to Cape Columbia, the extreme northern cape, 83° 7′ N. lat., 70° 30′ W. long., thence westward for sixty miles to 79° W. long., and from there gradually south to 82° 16′ N. lat. and 83° 33′ W. long., with no indication of land extending from there either westward or northward. Commander Beaumont, with his sledge party, traced the north-west and northern coast of Greenland from Polaris bay to a point east of Mount May in 50° 40′ W. long., where he sighted the farthest northern land seen in the expedition in 82° 54′ N. lat., and 48° 33′ W. long. (Cape Brittania and Mount Albert), and found that the Greenland coast runs from Mount May, in a south-easterly direction, to below the eighty-second parallel of north latitude, whilst Lieut. Archer explored Lady Franklin's bay, and Lieut. Fulford and Dr. Coppinger Peterman's Fiord and its vicinity, to which must be added magnetic and meteorological and other scientific observations carried on in the winter, with the thermometer ranging at one time at 73° below zero, and the labors of the naturalist. All this was accomplished in the face of the greatest obstacles and in the most trying circumstances with a cheerfulness, courage and perseverance on the part of both officers and men which is beyond all praise.

Being farther north than any former expedition, they passed an unparalleled Arctic winter of 142 days, nearly five months, without the light and heat of the sun, and endured the severest cold yet known. In the sledge expedition of Commander Markham, in the autumn of 1875, to Cape Joseph Henry, the fall of snow was so enormous that the men had to draw their sledges through it up to their knees, and frequently up to their waists, so that out of a party of twenty-four twelve were severely frost-bitten, and three suffered amputation of limbs.

In an attempt to communicate by a sledge party with the Dis-

covery, that vessel having wintered below in Robeson channel, Christian Peterson, the Danish interpreter from Upernavik, who had been Dr. Hayes' sledge driver, became so exhausted that nothing would keep him warm. They were consequently compelled to go back with him, and the poor fellow died shortly after his return to the vessel.

In Commander Markham's expedition in the following April across the Polar sea north, in the direction of the Pole, the men had not only to draw their sledges, but two heavy boats, fifteen and twenty feet long, over rugged floes of ice, separated by ridges sometimes thirty feet high, to make their way over the debris of the pack-ice broken up by the previous summer, and refrozen during the winter into chaotic, rugged masses of angular blocks, of every possible shape. They had frequently to cut their way with picks through the hummocks; and such were the contortions and checks, that they had frequently to go five times over the same ground; so that in making a distance of seventy-six miles toward the Pole they actually traveled over 276 miles. Each man had to drag 236 pounds, and to work from ten to twelve hours a day. They could pull but a few feet at a time, and make but from one mile and a quarter to two miles and three-quarters a day. They were absent on this sledge expedition, engaged in this incessant labor, for two months and a half; and, to add to their trials, the scurvy broke out amongst them, so that, when relief reached them, out of the seventeen of the party only five were able to drag the sledges. Commander Beaumont's sledge party along the north coast of Greenland, were beset with like difficulties. Enormous blocks of polar ice had been pressed against the shore, making the traveling one of incessant labor, so that seven days were occupied in moving only twenty miles. The scurvy also broke out with them; and when they came in, two only, Commander Beaumont and the quartermaster, were able to draw the sledges. The western sledge party, under Lieutenant Aldrich, found the same heavy ice extending along the whole coast. They were also attacked by the scurvy, Lieutenant Aldrich being the only one who escaped; and relief fortunately reached them the last day that most of them were able to travel.

Sir George Nares attributes the breaking out of the scurvy to the incessant labor to which the men were subjected in sledge parties. Had there been no sledging, he says, there would have been no scurvy. The order of the admiralty was to remain two years; but by remaining, says Sir George, "I could only explore Grant Land to the south and Greenland to the north-east. A lengthened journey over the Polar

pack with sledges and navigable boats is impracticable at any season, and with my whole resources I could only hope to reach about fifty miles beyond the point to which we had attained. My men had recovered from the scurvy, but could not be employed further on extended sledge journeys, and I, therefore, concluded to return" — a decision which has been approved by the admiralty. As a commander he was incessant in his care and watchfulness, and acted with great skill and judgment in the trying difficulties by which he was beset. He carried his own vessel to the highest point ever reached, and he and Captain Stephenson brought both vessels safely back on a return passage, which was one of great difficulty and trial.

But, whilst entertaining the highest opinion of the capacity, skillful seamanship, energy, prudence and judgment displayed by Sir George Nares in the command of this expedition, I regret to say that I cannot pass, without animadversion, certain matters in his report and in his address to the Royal Geographical Society.

One of the most gratifying things in the history of geographical exploration is the courtesy and kindliness with which, almost uniformly, subsequent explorers, especially in the Arctic, refer to the labors and discoveries of their predecessors. This is not only wanting on the part of Sir George Nares, but the only reference made to Drs. Kane and Hayes, the earliest explorers of the upper part of Smith's sound, is to speak of them unfavorably — to say that each of them published very misleading delineations of the coast, and to charge them with altering the names of the headlands discovered by Admiral Inglefield. In the absence of a statement by Sir George Nares of any particular facts in support of this general and condemnatory reference to both of these explorers, I feel called upon to say something upon the subject.

Dr. Hayes has answered for himself in a communication to the New York Herald, declaring that had Sir George examined the doctor's map, published by the Smithsonian Institution, he never would have made this assertion. Dr. Kane is dead, but I think I can state correctly what he did. Up to Cape Sabine on the west and Cape Hatherton on the east he recognized and retained the names given by Admiral Inglefield, but beyond these points names were given to the headlands, as they did not in any way correspond with the position of lands as they appear upon Admiral Inglefield's chart. Dr. Hayes, however, in his subsequent voyage, restored several of Admiral Inglefield's names upon the western coast. Having known

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pack with sledges and navigable boats is impracticable at any season, and with my whole resources I could only hope to reach about fifty miles beyond the point to which we had attained. My men had recovered from the scurvy, but could not be employed further on extended sledge journeys, and I, therefore, concluded to return" — a decision which has been approved by the admiralty. As a commander he was incessant in his care and watchfulness, and acted with great skill and judgment in the trying difficulties by which he was beset. He carried his own vessel to the highest point ever reached, and he and Captain Stephenson brought both vessels safely back on a return passage, which was one of great difficulty and trial.

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Dr. Kane well and knowing Dr. Hayes intimately, I am confident that neither would designedly obliterate names to appropriate to themselves the laurels of a prior discoverer. In this connection it may not be inappropriate to recall the well known fact that the name of Grinnell Land, in Wellington channel, discovered by De Haven in the Grinnell expedition, was for some time omitted upon English maps, and afterwards an English name was given to it, which I refer to simply to suggest the application of the homely proverb indicating what those should avoid who live in glass houses.

In respect to the complaint that their delineation of the coast line was misleading, it is to be remembered that Dr. Kane's and Dr. Hayes' expeditions were private enterprises, fitted out with a comparatively small sum of money, which in neither case exceeded $25,000, and that these expeditions were deficient in most of those appliances which are deemed requisite in Arctic explorations, both for nautical and scientific purposes. They went in small, frail sailing vessels — one being but 144 and the other 133 tons — to explore an unknown region, and, as I know, with very little public encouragement, for a large part of the expense had to be borne by themselves. Both, though young and inexperienced, proved to be able commanders. Neither were professed seamen, and, therefore, in the tracing and delineation of coast lines are not to be contrasted with trained naval officers, and yet what they accomplished, when the inadequacy of their means is considered, was very remarkable, and well worthy of the recognition it received from scientific societies and governments, both at home and abroad.

Kane reached to nearly 81°, Hayes nearly to 82° N. lat., and Hayes made a sledge journey of 700 miles, which was greater in length than any sledge journey in the recent expedition, and, from the few men that he had, it involved quite as much physical exertion. Dr. Peterman has truly said that justice has never been done to Dr. Hayes' achievements in the Arctic regions.

Let us now contrast with this the expedition of Sir George Nares, which cannot be better described than by quoting his own words in a speech at a banquet given to him and his officers in England before their departure:

"Permit me to say that no similar expedition has ever quitted the shores of this or any other country *as well prepared as we are*. Our ships are excellent, our equipment perfect, and we have all the resources that we could reasonably hope for. Our officers and our

men have been chosen with great care from among a great number of volunteers. They depend each upon the other, and their whole heart is in the work. Our route is well traced, our instructions given with extreme precision, and we set out with all the dearly-bought experience of other expeditions," closing with the remark, that "Now that England has resolved to take part in these enterprises, success is certain."

After this, how strangely does it sound to hear him complain, on his return, of the deficiencies of the coast line as given by explorers who went into Smith's sound without any maps at all.

His expedition was directed to remain two years; to attempt to gain the highest northern latitudes, and, if possible, to reach the Pole. It returned in one year, without accomplishing as much as was expected. While it may be freely admitted that they did all that they could, and, with a crew enfeebled by scurvy, were justified in returning without attempting to do more; still, having failed to achieve all that was hoped for by themselves, by the goverment that sent them, and by the world, a simple statement of the facts and the conclusions arrived at was what was to be expected on the part of the commander, in a report which was necessarily, to a certain extent, apologetic and explanatory, without seeking to impair the value of the prior labors of Dr. Kane and Dr. Hayes. The manner in which they are referred to, is by a passage in which even more is implied than is expressed. The effect of it upon the general reader is to convey the impression that their expeditions were of little, if of any value, and to give more point to it, in Sir George Nares' address before the Royal Geographical Society, Captain Buddington is highly commended and a statement made in respect to him that is wholly without foundation. "He would," says Sir George, "if he had not been overpowered by a majority, have informed us of the Polar ice long ago, and we all look upon him as a very hardly used man." Now, so far from there being the slightest ground for such gratuitous suggestion as this, Captain Buddington, upon his return, stated his views very freely to all. He did so to me and publicly before this Society, in one of the largest assemblages ever convened in a public hall in this city, and at my personal request he put them in writing in the form of a communication to the Society, which we published at the time and which will be found printed in our journal of that year. Nor can I perceive how he could have given information respecting the Polar ice which Sir George Nares saw and studied in the Polar sea, as he was never there.

He says, in the communication referred to, that they were stopped at 82° 16′ north latitude, by "old heavy floes," but of the state or nature of the ice beyond that, except so far as it was within the range of his vision, he knew nothing.

The return of the expedition and its results, have given rise to a great deal of discussion, both in this country and in England. Sir George Nares is of opinion, and Dr. Peterman, in a recent letter, concurs with him, that any further attempt to reach a higher latitude by the way of Smith's sound is hopeless, and that any future effort must be by the route between Spitzbergen and Nova Zembla. I fully agree in the correctness of this judgment, so far as respects any attempt to get farther north by the way of Smith's sound in a vessel. I have never found sufficient facts to lead me to believe that there is an open polar sea that can be reached by a vessel, nor any physical reasons why there should be a great space of open water at the Pole or in its vicinity. This belief is a very old one. The supposed sea is to be found represented upon a map published 268 years ago. There may possibly be such a sea. The knowledge we possess will not warrant the assumption that it does not exist; but it will warrant this statement — that the more we become acquainted with the area of the polar basin, and the nearer we get to the Pole, the less indications there are of the existence of such a sea. I am not, therefore, very hopeful that any vessel will be able to get much farther north than vessels have already attained; but I do believe, notwithstanding the result of the English expedition, that the Polar area can be traversed much farther north in that direction by sledging, and that it can be done by the way of Smith's sound as effectually as between Spitzbergen and Nova Zembla. The plan which Dr. Hayes laid before this Society eight years ago, of establishing a station at Port Foulke, where subsistence can be easily obtained, and with which communication can be regularly kept up by sea, as a base from which expeditions may be directed to the north as favorable opportunities offer, I have always thought the best plan of polar exploration, and for many reasons preferable to sending out large expeditions. It would not require a large force, would afford opportunity for the training and experience in the Arctic regions which is requisite, and could be kept up at a comparatively small expense; renewing the force, if necessary, after two years, which is as long as men are able to labor in the Arctic. Capt. H. W. Howgate, of the United States Signal Service, has recently called public attention to a plan substantially of this

character, and a bill embodying his suggestion is now before Congress, to establish a temporary station for the purpose of exploration at some point north of 81° N. lat., on or near the shore of Lady Franklin's bay; and Capt. I. L. Norton, a shipmaster who has had some experience in the Antarctic, is maturing a like plan, which he advises me he will lay before this Society.

CENTRAL AND SOUTH AMERICA.

Inter-oceanic Ship Canal.

The several surveys instituted by our government across the American isthmus, to ascertain the most feasible route for the construction of an inter-oceanic ship canal, have been completed, and although all the reports have not yet been published, it is understood that the result of the surveys shows that the Nicaragua route is the most practicable. It will take ten years at least to construct it, and the cost is estimated at about ten millions of dollars. The Department of State, it is said, is now in correspondence with various friendly powers for the negotiation of treaties guaranteeing the neutrality of the canal; for a work of such magnitude must be constructed by governments that will participate in the undertaking. Intelligence has recently been received of the arrival in the Bay of San Miguel of the French expedition sent out by the Commission de Géographie Commercial of Paris for the survey of a route, but what route or routes they propose to explore I am not advised.

Mr. A. Le Plongeon, who, it will be remembered, some years ago read a paper before this Society, has been engaged during the year in exploring the ruins of Yucatan, and has sent to this city 200 interesting photographs. He was interrupted in the prosecution of his researches by an insurrection among the people, and when heard from last month had taken refuge upon a small island upon the coast (Isla de Muferes), to which he escaped in a boat. He writes that upon the coast, about six miles distance from his place of refuge, are the ruins of an ancient city, formerly known as Ekab, but now called Ineco, the ruins of which were distinctly visible through the spy-glass. He says that at the time of the conquest it was reported to be a large city, that the ruins have never been explored, and that that part of Yucatan is now occupied by a race of Indians who are exceedingly hostile, and put to death any white man who comes within their power. With American pertinacity, he declares that he means,

nevertheless, to go there; that he is not afraid of the Indians; that he hopes to be able to learn all about this ancient city, and obtain photographs of the remains.

J. G. Lobato has been engaged, during the year, investigating the meteorological conditions of the valley of Mexico, and Commander Muster, R. N., has been occupied in fixing the position of various places in Bolivia, and correcting the geography of the Amazon.

A cavern has been found in Cuba containing Carib remains, indicating that the whole of that island was formerly inhabited by the Caribs.

Prof. Weiner has been occupied during the year in ethnological researches in South America, and reports from Pachacamac that he has discovered glaciers in the Andes of Chili, which had been questioned by Agassiz; and Prof. Hartt, chief of the Brazilian survey, is reported to have recently made important geological discoveries in Brazil. The government of Brazil has undertaken the measurement of an arc on the parallel of 28° S. lat., extending over nine or ten degrees of longitude, connecting the capital of the country with the great meridian of Brazil.

The Amazon is now navigated by steamers 3,000 miles from its mouth, and several of its tributary rivers have been opened up to steam navigation. I would especially call attention to the great commercial importance to the United States of direct and regular communication from this country by steam with the mouth of the Amazon, in view of the importance of the regions of the upper Amazon and its tributaries, which are now made accessible by steamers.

EUROPE.

The initiatory steps have been taken for the measurement of an arc of the meridian parallel with Algeria, the only remaining work being the determination of the position of Nemours by careful astronomical and terrestrial observations.

The surveys in Austria have been actively prosecuted; 2,066 square miles have been surveyed in Galitia and Hungary, and 200,000 altitudes determined. Seventy-three sheets of the new map of Austria have been completed, which includes the whole of the Tyrol, the greater part of Transylvania, and parts of Lower Austria and Bukowina.

The surveys in Turkey and Greece have been carried on, and promise at an early day, a good map of the Balkan peninsula. Signor

H. di Gubernatis, after spending six years in the survey of the Epirus, has prepared a very valuable map of the ethnological distribution in the Epirus of the Greeks, Albanians and Wallachians.

Capt. E. Willie was engaged last summer in the vessel Voringen in making deep sea soundings between Norway, the Shetlands, the Færoes, Iceland and E. Greenland, which is to be kept up for several summers.

ASIA.

The Russians and others have been very active, and have had numerous expeditions during the year in Asia, chiefly in Siberia and North-eastern Asia. My space will admit only of mentioning the names: Lieut. Sandeberg and Prof. Wagner, in the regions around the White sea; M. Grunm, in the country of the Caspian; General Skobleffs, in the exploration and survey of the Altai and Trans-Altai mountains and the northern part of the Pamir; M. Poliakoff, in the lower part of the River Ob; M. Chersky, upon the Irkoort river; M. Rheinthal, from Wjernga to Kashgar; M. Scvertslow, in the valley of Fergani and the neighboring mountains; Mr. Ney Elias, in the valley of the Shueli, in the western part of the Chinese province of Yunnan; M. Potanin, in East and North-west Mongolia; Colonel Prejevalsky, of the region between the Himalayas and the Tiein-Shan, China and Turkestan; Dr. A. Wojeckoff, in Japan and Siam; and the Abbè Montrosier, in the exploration of both branches of the Mekong, in Cochin China.

Colonel Bolschef has been surveying the Siberian coast between parallel 45° and 52° N. lat. from Plasten bay to Castries bay. The undertaking was one of great difficulty and hardship. The country was found to be mountainous, the range of Barin traversing the whole coast. The land is watered by numerous streams, flowing through valleys. The soil is good, the vegetation luxurious, and being close to the coast, is well adapted for colonization. To the north there is a great quantity of fine ship timber, and lead, copper, gold, silver and coal were found.

Chekanofsky Expedition to the Olenck.

M. Chekanofsky, to whose previous labors I have frequently referred, explored the lower course of the Lena and the Olenck rivers. The season was too far advanced to enable him to descend to the mouth of the Lena, and after passing down that river some distance, he crossed the country with reindeer to the Olenck, which he

descended to its mouth. The object of this journey was geographical, geological and botanical. Upon encamping at the mouth of the Olenck, facing the dreary waste of waters of the Siberian sea, he found close to his camp two old worn graves covered with lichen, and near them the remains of a cross. Upon inspection, he found an inscription showing that they were the graves of the intrepid Russian explorer Prontschischtschew and his heroic wife, who died and were buried there 140 years ago. Prontschischtschew was a young Russian lieutenant who was sent in a small vessel from Yakotz down the Lena, to attempt the passage by the westward, around the northern coast of Asia, to the mouth of the Yenisei river. When he received his orders for this expedition he had just been married, and his young wife resolved to go with him. He sailed down the river Lena without any difficulty, and passing out of the mouth of that river, sailed westward to the river Olenck, where he passed the winter, and in the spring of the year of 1736 he attempted the passage around the northwestern coast of Asia, a region then wholly unknown, and upon approaching Cape Tschelguskin, the extreme northern point of Asia, which has never yet been passed, his vessel became entangled in the ice, which involved all on board in such constant peril, and imposed upon the commander such incessant labor, that he fell ill, and during his illness was so affected by the sufferings of his crew (to whom he had become much attached, and by whom he was very much beloved), that he died. The crew succeeded, after great efforts and peril, in extricating the vessel and bringing her to the mouth of the Olenck, upon the desolate shore of which they buried Prontschischtschew. His wife, overwhelmed by her loss, died a few days after his burial, and was laid in a grave beside him. The crew passed a terrible winter, and in the spring succeeded in bringing their vessel into the Lena, and found their way back to Yakotz.

Chekanofsky, who knew all these facts, tenderly recorded in his journal the discovery of the graves, expressing the hope that the Russian government would mark the spot by a permanent monument, little imagining how soon, to quote a line from Pope, he should "want the generous tear he paid." This learned and energetic explorer was condemned to exile in Siberia, for what offense I know not; and, being a man of high scientific attainments, he passed ten years there in investigating the geography, geology and botany of the country. He returned to St. Petersburg last autumn, bringing back with him extensive collections, chiefly botanical; and shortly after

his arrival was found, one morning, dead in his bed. It is said in the Russian newspapers that he probably poisoned himself, which, unless satisfactorily established, it is hard to believe of this distinguished man, who had returned to St. Petersburg with his collections, to lay before the world the result of his long and arduous labors.

Dr. Finsch's Expedition to the Ob and the Irtish.

The German Arctic Society determined upon a plan for polar research by the establishment of scientific observatories, with expeditionary trips and yearly communication, in Siberia; and last summer Dr. Otto Finsch, curator of the Bremen Museum of Natural History, and Dr. A. Brehm, were dispatched for this purpose, accompanied, as a volunteer, by Count Waldberg Zeil, heretofore known by his journey to Spitzbergen with Heuglin in 1870. Last July they reached Obdorsk, the most northern settlement on the river Ob, where they met the Russian expedition, organized for the survey of the rivers Bar and Chuca, that flow into the Sea of Kara, and the course of the River Ob, to determine the possibility of connecting these rivers with a canal. From thence Dr. Finsch and his party made their way to the Kara sea, a very difficult route; and upon their return last autumn they passed through the Kara sea and the strait without any impediment from the ice, and have transmitted a very interesting account of their journey in Siberia. As they descended the River Irtish, the scenery constantly reminded them of the Rhine, and they found the Ob to be a very imposing river.

I had the pleasure of meeting Dr. Finsch upon his recent visit to this country, and can appreciate that it was a most judicious selection to confide this important expedition to a man of his scientific attainments, energy and capacity.

Messrs. Sidensner and Lopatin have explored the Rivers Ket and Chulym, in Siberia, to ascertain if it is possible to join the Rivers Ob and Yenisei. They found that the River Ket could be used for that purpose, but that the Chulym could not. They traced the Ket to its source.

Nordenskjöld's Expedition to the Yenisei.

Prof. Nordenskjöld, whom we expected to have had the pleasure of seeing at our meeting last July, left, as you will remember, shortly before, that he might be in time for his second expedition to the mouth of the Yenisei to organize a commercial communication by

water between the northern countries of Europe and the northern portion of Asia. A German writer, in a paper published during the year, declared such an undertaking to be hopeless. He said that, although Prof. Nordenskjöld had succeeded in getting through to the Kara sea last year, it was under exceptionally favorable circumstances; that two Norwegian captains had both lost their vessels in the straits by which Nordenskjöld passed; and that if he made the attempt again it by no means followed that he would be successful. I mention this circumstance to show how prone what are called "parlor" geographers are to make unfavorable predictions, and how unsafe it is to do so. Prof. Nordenskjöld not only passed again safely through the straits into the Kara sea and to the mouth of the Yenisei, but has already returned. He found the Kara sea free from ice in September, and declares that the navigability of the Yenisei is now ascertained, and is confident that a trade route may be established to that river through the Kara sea, in which Dr. Finsch, who passed through shortly after Nordenskjöld, fully concurs.

TIBET.

A wonderful journey has been made through Tibet by the Pundit Nain Sing, of Colonel Montgomerie's corps. Starting from Western Tibet, he followed a series of lakes upon an elevated plateau, from 13,000 to 15,000 feet high, for a distance of 800 miles, the most westerly of which lakes is the Pagong, seen by some of the members of Forsyth's expedition. To the north of the Pagong he discovered numerous great lakes, which receive the northern drainage of the Himalayas.

JAPAN AND SIAM.

Lieutenant R. Crooke made an interesting journey on foot through the mountain districts of Central Japan, of which he has given an account. The route he traversed is little known to Europeans. Lieutenant Day, U. S. N., has made a trignometrical survey of the island of Hokkaido, and Mr. D. P. Edwards, of Bangkok, made an extensive journey through the interior of Siam, gathering a large amount of valuable geographical information.

PERSIA.

Doctor Andrez, to whose expedition to Persia I have heretofore referred, was engaged during the year in making excavations at Kisbeker, where he had found many cuneiform inscriptions. After termi-

nating his labors there he intends to make like explorations among the ruins of Shappus and of Persepolis. Colonel McGregor, of the British army, has made a journey through a part of Persia to the Russian frontier and returned by the route of Colonel Napier, of whose journey I gave an account last year. It appears, by a statement of Colonel Napier, that the Turcomans are undergoing a desirable change — that they are giving up their marauding habits and becoming agriculturists.

India.

The great survey of India goes on at the rate of 40,000 square miles per annum. Mr. Scanlan, of the organization, has given a graphic account of Deolia, built only 376 years ago, but now its houses are tenantless, its streets desolate, and silence reigns in its highly decorated palace; and F. B. Girdlestone visited the ruined city of Manda, the ancient capital of Malwa, the walls of which covered a circuit of thirty miles. Its former magnificence was apparent in the enormous mass of ruins of palaces, tanks, temples, and of towns and villages around it. Its decay, says the editor of the Geographical Magazine, was the result of the destruction of its ancient kings and armies by constant wars, which drove the tradespeople to other marts and converted those who remained into predatory hordes. The country where it is situated is now difficult of approach, unhealthy, abounding in wild beasts, and inhabited by the Bhils, a people who are very averse to being intruded upon, and who would not furnish guides or aid the surveyors in any way.

Palestine.

Mr. Victor Guèrin has been engaged in exploring the ruins of Pala, Guadara, Galama, and other ancient cities, and is to complete his work by an exploration of Tyre and its environs.

The American Palestine Exploration Society has suspended the work of triangulation, in accordance with the advice of the advisory committee in Beirut, both because of the disturbed condition of Turkey and the continued commercial depression at home. The engineers have reconnoitered nearly the whole territory east of the Jordan. Dr. Selah Merrill, archæologist of the society, remains in Syria to prosecute the work entrusted to him. He has carefully explored a portion of the Jordan valley, and has made important discoveries. The society has received 100 large and

splendid photographs of ruins and scenery beyond the Jordan; also, more than 130 stuffed birds, to illustrate the ornithology of the Holy Land.

RUINED CITIES EAST OF THE JORDAN.

I have frequently called your attention to the remarkable remains that are found in the country east of the Jordan, the Moab, Bashan and Gilead of the Bible, of which, until the recent explorations, nothing comparatively was known. Though this part of Syria may be reached in a few days from the northern part of the Dead sea, or from the Sea of Galilee, it is not visited by travelers, in consequence of the rugged nature of the country and the hostile tribes of Bedouins that inhabit it. It has now been ascertained to abound in architectural and archæological remains of the greatest interest. It is literally strewn with ruins of towns and of structures, many of them remarkable for their massiveness, which belong to a past civilization of which we know nothing. You will remember that some years ago, from the indications which then existed, I expressed the opinion that this must have been, at an early period, one of the chief routes between Asia and Africa; and the ruins which have since been found in the explorations carried on by the American society, confirm that impression.

Dr. William Thompson, the veteran American missionary and explorer in Syria, says in a recent letter that, in making a tour through this region, nothing ever impressed him so much as the richness of this field in the remains of ancient civilization. He says that there are not only acres on acres of splendid ruins, but fortifications, temples, baths and theaters, the best preserved in existence, and which have evidently stood undisturbed for ages. While on the west side of the Jordan, he remarks, cities have been robbed to build other cities, just as the ruins of Tyre are now contributing ship-loads of stone toward building the present city of Beirut, the east side of the Jordan has remained unmolested for 1,500 years; and there exists there an unequaled combination of art and nature in an untouched condition of splendor and ruin.

AFRICA.

THE INTERNATIONAL CONFERENCE AT BRUSSELS.

The work of exploration and investigation in respect to the unknown portions of Africa, has been vigorously followed up during

the year. I alluded, in the commencement of my remarks, to the important movement inaugurated by the king of Belgium. His majesty invited the leading African explorers, several eminent geographers, and the heads of the geographical societies of Great Britain, France, Germany, Italy, Russia and the United States, to meet him at a conference which was held on the twelfth, thirteenth and fourteenth of last September, at the palace in Brussels, to consider the subject of the scientific exploration of the unknown parts of Africa, and the best method of penetrating into the interior of that continent, with a view to its civilization and the abolition of the slave trade. At this conference, over which the king presided, and which was of a very interesting character, the well-known African travelers, Col. Grant, Rohlf, Schweinfurth, Natchtigall, the Marquis de Compiègne, Lt. Lux and Commander Cameron, at the request of the king, gave a brief account of their respective labors and experiences, and the conference, after a very interesting discussion, arrived, with great unanimity, at these conclusions:

1. That there should be established an international commission for the exploration and civilization of Central Africa, with a view of centralizing, as far as possible, such efforts as might be made in different nations to facilitate that object.

2. That the commission should be composed of the presidents of the geographical societies which were represented at the conference, or who should thereafter become attached to the organization, and of two members to be chosen from a national committee to be established in the countries represented.

3. That the central commission, after adopting its rules, should, through the organization of a permanent executive committee, carry out the enterprises and labors agreed upon, and manage the funds furnished by governments, national committees or by individuals. The executive committee to consist of the president and of three or four members designated at first by the conference, and afterwards by the international commission to be established.

4. That the best course of procedure was to establish a permanent station upon the eastern coast of Africa, from which a chain of stations might gradually be extended into the interior, which, while affording every facility for missionary efforts or commercial enterprises, were not to be directly connected with either, but to act under the direction of the international commission in carrying out its general objects.

The international commission was accordingly organized; his majesty the king was made the president; the yearly executive committee, to be located in Brussels, was appointed, and measures were taken for the formation in the different nations of national committees, which are now being effectively carried out in the several countries. His majesty did me the honor to invite me to the conference, but very much to my regret my judicial engagements at the time made it impossible for me to go. He has since advised me that I have been made a member of the international committee, with a request that I would undertake the formation of a national committee in this country, which I have agreed to do, and am now taking measures to carry out, in conjunction with gentlemen interested in this plan, for exploring the interior of Central Africa, and advancing civilization in that large, fruitful and healthy region of the great African continent.

I cannot speak in terms too eulogistic of the example set by this enlightened monarch in inaugurating this important movement; of the earnestness with which he has imposed upon himself laborious duties to carry this great measure into effect; and when so many of the leading nations of the world have already coöperated, I feel assured that the citizens of the United States will not be found wanting in an appreciation of, or fail to do their part to ensure the success of, a movement which addresses itself alike to their humanity and their intelligence.

WEST AFRICA.

A. Beaumier, the French Consul at Magadore, in Morocco, who died last January, left the result of his journeys during a period of twenty years along the west coast of Africa, from Tangiers to Magadore, with which he was better acquainted than any European, in the form of a valuable map; and M. Tissot, the French Minister at Morocco, has supplied a valuable topographical map of the north-west coast to 34° N. lat. both of which maps have been published by the French Geographical Society.

THE NIGER, VOLTA, OGOWE AND CONGO RIVERS.

Mr. A. Bowdin, who has advanced into the interior from Sierra Leone, is satisfied that a new route might be found in that direction to the source of the Niger, and declares that if the pacific course of Commander Cameron were pursued that there would be no difficulty in a solution of the Niger problem. A. Bonnat, a resident of

Western Africa, has ascended the Volta and made a valuable map of the river up to the city of Salaga. He found the river as wide and as deep at Tegly as it is at Medica, sixty miles from its mouth, and infers from this that its sources must be far away in the interior. It is a river of 200 miles in length, which takes its rise in the Kong mountains. The exploration of the Ogowè river, just below the Equator, the mouth of which is in the possession of the French, has been for some time an object of interest as a means of penetrating the interior. The Marquis de Compeigne made the attempt, but reached only as far as Osieba, when he was compelled to return, in consequence of the hostility of the natives. It was last year renewed by Lieutenant Brazza, of the French navy, who has undertaken to explore the river, and to make his way, if possible, to the Mwutan Nizige (Albert Nyanza). Lieutenant Marche followed him, and both travelers reached Okanda last February, where they were joined by Dr. Bailly. They were assured that the Ogowè flows from the north to within a degree of the Equator, and then turns sharply to the south. They were heard from last June, were doing well, and at the end of the rainy season were to start for the countries of the Aduma and Oss Yebs. Dr. Lenz, who had gone as far as the country of the Sunbaz, was compelled to return from ill health. Drs. Peschnel, Loesche and Linder have undertaken to penetrate the interior from Loango, and Dr. Pogge, who was engaged in exploring Angola, is supposed to have reached Kabebe, about 24° E. long., and to be on his way to Lake Tanganyka, in E. long. 29°. P. Duparquet, a Catholic missionary, has ascended the Congo as far as Bomba, which he found quite European in its features, the natives having removed altogether to the neighboring villages, which are very populous.

Angola.

Mr. J. S. Monteiro, who has enjoyed unusual opportunities for observation, has, in a recent work on Angola and the River Congo, furnished a valuable amount of information upon this part of the country, its productions and inhabitants. His estimate of the negro character is a very low one. It is that he knows neither love, affection nor jealousy, and has no idea of mercy or compassion; that he is characterized by an absence of good qualities, feelings and emotions that we can scarcely realize to be wanting in human nature. This may be true of the African of that part of the eastern coast, but it is to be hoped that it is not true of the aboriginies of Africa generally.

LOANDO.

Lieutenant Lux penetrated from Loando into the interior. He crossed the Talamunga mountains, from 4,000 to 5,000 feet high, and reached the Quango river, which he ascended to its source, in a hilly table-land, where it rises with three other rivers, one of which he looked upon as the head of the Congo; but the information collected by Cameron, it is thought, renders it highly probable that the Lualaba of Livingston is the Upper Congo. Lieutenant Lux reached the country of the Muata Yauvo, but was attacked by fever and compelled to return.

THE PIGMIES OF AFRICA.

The subject of the pigmies of Africa has been recently discussed by Mr. Marcette and the Marquis de Compeigne. When our fellow, M. du Chaillu, several years ago laid before us the account of the pigmies he had found in Western Africa, near the Equator, it was received in certain parts of Europe with incredulity; but these pigmies of the western coast have since been seen by others, and the existence of races of pigmies is now established by the facts gathered by Schweinfurth, Miani and others in Africa, and by recent researches in India. Mr. Marcette says that these pigmies were well known to the ancient Egyptians, and that there is a bas-relief in the sepulchre of the Necropolis of Saggarale, of the fifth dynasty, upon which two pigmies are represented having the features of Dr. Schweinfurth's Akkas. He says the pigmies of antiquity were natives of Pun, which he identifies with the modern Somali country. The Phœnecians, he says, came from Pun, and were not an Asiatic race, and that near them dwelt a race of dwarfs called Bess, who still exist in the Somali country, if the information collected by Heuglin could be trusted. He exhibited to the Egyptian Geographical Society representations of the Bess, some of whom had tails, which may be gratifying intelligence to these evolutionists who insist upon our descent from the monkey. Mr. Marcette believes that the Akkas of Schweinfurth, who dwell in the Nyam Nyam country, were also known to the ancient Egyptians, and that Nam in their language meant dwarf. M. de Compeigne thinks that these pigmies extend from the south of Mombutta to the Gaboon.

An inhabitant of the Gaboon, in the person of a live young gorilla, is now in the Berlin aquarium. Dr. Herme says that he nods, claps his hands, wakes up and stretches himself like a man; that he sleeps eight hours, eats only what his keeper eats, and requires him to

be constantly with him. He was taken sick and was restored by the use of that fever specific, quinine, and the doctor says that he showed his tongue and afterwards squeezed the doctor's hand, as if to indicate that he felt assured of his recovery.

Akem — Horned Men.

Capt. I. S. Hay, B. A., has recently visited the district of Akem, which lies west of the River Volta, in the north of that portion of Ashantee which after the war was annexed by the English. It is a heavily wooded country, in which the trees have an immense height and girth, some of which he found to be over 200 feet high. The soil is exceedingly rich, but the forests being left in their primeval state, cultivation has been impossible. The entire country is auriferous in a high degree. It is well watered, and the towns, which are on or near the hills are numerous. The climate is humid throughout the year; the men are capable of undergoing great fatigue, but are incorrigibly idle, and the women do all the work. Amongst the men he found an extraordinary growth or enlargement of the cheek-bones under the eyes. It is in the form of horns on each side of the nose, and so long that in some instances the man had to squint violently to see at all. The growth begins in childhood. The skin is not broken, but stretches over the horns like a glove. This phenomena he thought peculiar to the tribe in Akem, as he did not find it in any other. Photographs of these horned men, it is said, have recently been received in England.

North Africa.

MM. Roudaire and Depuis have presented their plan for submerging a portion of North Africa, from the Gulf of Gabes, by letting in the water of the Mediterranean westward over the region of Laho-Dejerld, which, it is assumed, would not only be practicable, but remunerative. From the small area submerged, none of the important meteorological changes of the winds and currents of the North Atlantic are apprehended, which were suggested as likely to occur from the former proposition to submerge the western part of the Sahara.

M. Largeau made a journey in the course of the year across the southern part of the Algerian Sahara to Ghadames, of which he gave a very full account in a series of letters to the New York Herald. The object of the expedition was to establish regular commercial

intercourse between Ghadames and Algeria, and this winter M. Largeau started again upon a like journey.

Doctors Schweinfurth and Güssfeldt made an exploration of the Arabian desert east of the Nile. They found the Lybian desert surrounded by steep precipices, being the old coasts of an eocene ocean. They spent several days upon the summit of the Galâla, where a flora was found new to Egypt, 3,300 feet above the sea, and the plateau was covered with such a dense carpet of herbs that it was impossible to touch the soil. The geographical position of many places was determined. The scenery through which they passed is described by them in glowing terms.

Darfur has been organized under an Egyptian governor and now forms a province of Egypt. The exploration of the country has been actively prosecuted, and the population is computed at 300,000.

LAKE MWUTAN NIZIGE (ALBERT NYANZA).

The most important event in Africa, of the year, has been the circumnavigation of the Mwutan Nizige (Albert Nyanza), by M. P. Gessi, a member of Col. Gordon's organization. He estimated the lake to be 140 miles in length by fifty in breadth. Its banks were clothed with a dense forest, the western side was mountainous and the southern end shallow. This exploration establishes the connection between this lake and the Nile.

From united statements of Gessi and Colonel Gordon, very recently received, it appears that the White Nile is navigable the whole way from Dufli to the lake, a distance of 164 miles. About twenty miles south of Dufli the river widens, the current is less rapid, and from there to Magungo (on the lake) the river is nothing more than a part of the Mwutan Nizige. This river or expansion of the lake is broad, deep, and filled with islands of papyrus, which make the banks difficult of approach. About 100 miles from Dufli there is a large branch of the river, extending north-north-west in the direction of the Nyam-Nyams. This is upon the report of Gessi. Colonel Gordon did not see this branch, but states that he has no doubt of its existence. The country from Dufli to the lake is rich, exceedingly populous, cattle are abundant, and plenty reigns everywhere. Gessi says, on native information, that there is no river flowing into the lake at the south; but native information cannot generally be relied on, and there is no certainty on this point until its extreme southern shores have been reached and fully explored. Gessi assumed, from its

shallowness and marshy appearance, that he had reached the southern end, but the lake is much longer; for Stanley, last January, in an expedition, to which I shall hereafter refer, reached it about thirty miles below the limit of Gessi's southern exploration, coming upon a large gulf, to which he gave the name of Beatrice gulf, and of which there is no indication on Gessi's map.

Whilst Gessi was circumnavigating the lake Colonel Gordon explored the country east of it, establishing a chain of military posts from Gondokoro to both the Mwutan Nizige and the Ukerewe (Victoria Nyanza). He penetrated to M'ruli, on the Somerset river, and has established a station at Masuidi, the capital of Unyoro. The Somerset Nile, which connects the two lakes, he says is navigable from the Mwutan Nizige to Murchison's falls; but from there to the Karuma rapids that it abounds in strong rapids; and between Murchison's falls and Foueira that it has a fall of 700 feet.

Stanley's Expedition.

Mr. Stanley, after exploring the west and south-western shores of Lake Ukerewe (Victoria Nyanza) started from Dumo, on its western shore, and crossed the country of Unyora, to the Mwutan Nizige (Albert Nyanza), and reached that lake, as I have said, at a point where a deep gulf (Beatrice gulf), formed by a promontory called Unsongora, runs out for thirty miles in a south-westerly direction.

In his journey Stanley saw a mountain south-east of the Mwutan Nizigi, which was reported to be from 13,000 to 15,000 feet high, called Gamboragarè, on the peak of which snow is frequently found.

The exact position of his camp on the lake, as given by him, is 31° 24′ 30″ E. long., and 0° 25′ 0″ N. lat.

The country of Unyora, he says, extends along the whole eastern shore. The country on the south shore is called Ruanda. On its western shore, opposite Gulf Beatrice, is Ukonju, said to be peopled by cannibals, and that its further western shore to the north is the country of Ulegga. Stanley learned that the people on the south and south-western shores were very hostile, and abandoned all attempt to explore the lake in that direction. Retracing his steps, he entered the Kitangule river, the main feeder of Lake Ukerewe, and, following up the course of that river, he circumnavigated the lake named by Speke Lake Windermere, and after a three-days' journey reached another lake, nine miles long by one mile wide, which may be but a temporary enlargement of the river, as he was traveling in the rainy

season; and afterward, on the frontiers of Karewega, he found Lake Akengara, noted on Speke's map. Stanley, when last heard from, in July, was on his way to Unamyembi; his intention being to proceed to Ujiji to explore Lake Tanganyika, and then endeavor to strike north toward the Mwutan Nizige (Albert Nyanza).

CENTRAL AFRICA.

Commander Cameron gave a detailed account of his journey across Central Africa to the British Association. He said that the result of it was almost to settle definitely the line of the Central African lake sources; that the chief products now of Central Africa were ivory and slaves, carried on by the Portuguese and Arabs; that the Arabs, coming from the east coast, had penetrated into the interior of the country west of the Tanganyika; and that westward from Katanga there were large copper mines; that coal was found in the Tanganyika country, cinnabar at Kilemba, and tin on the shores of Lake Kassala; that sugar-cane grew well along the whole eastern coast and along the Tanganyika. Rice in several places grew in wild luxuriance, and in one year returned a hundred-fold under cultivation. Wheat was cultivated, and cotton grew all along the valley of the Congo, Lualaba and Zambezi. On one of the islands of Lake Tanganyika hemp was found growing to a great height. The whole country, however, was at present a vast slave-field, and all the various products he had mentioned were lying there for any one to take them away. Ivory, he remarked, was not the chief wealth of Africa; it was her vegetable and mineral products, and education would make her people very industrious were they not ruined by the slave trade. He declared that the way to stop that trade was to open up the rivers Congo and Zambezi; and finally, that there was a way across the continent by a system of water navigation which had no second in the world.

LAKE NYASSA.

The missionary establishment on Lake Nyassa, in memory of Livingston, has been successfully established by Mr. E. D. Young. A steamer was carried in parts to the lake, and there put together and launched. Last February, a communication was received by the Royal Geographical Society from Mr. Young, giving an account of the exploration of the lake with this steamer. The lake was found much larger than Dr. Livingston supposed, the north end extending to 9° 20′ south latitude. In most parts it was very deep, in some

places no bottom being found at 100 fathoms. It has a range of mountains extending nearly a hundred miles, ranging from 10,000 to 12,000 feet above the sea. It has a number of rivers running into it, but none navigable to any great distance, and a river running out of it called, by the natives, Revoma. The shores are not so thickly populated as formerly, as a great number of the inhabitants have been carried off as slaves. In some parts of the lake there are a number of villages built on piles, so that we have here, also, the piled dwellings like those found on the Swiss lakes, and in Central Africa and New Guinea.

The scenery of the lake, as described by Mr. Young, is grand in the extreme. He says that he visited some lovely spots and the sites of many villages, where the ground was strewn with thousands of skeletons, the remains of poor creatures who were killed in attempting to escape from the slave traders. From the information he gathered, he thought that no less than 20,000 persons a year were carried off as slaves. The Arab traders were astonished and alarmed when they heard that there was a steamer on the lake, and no slaves were conveyed across it for a month. "Oh! how I long," writes Mr. Young, "to have a turn at them and clear the blood-thirsty wretches out of this lovely country. I believe that a steamer with a dozen resolute Englishmen and a few bales of calico would put a stop to the whole traffic," and as this is one of the great central points of the slave trade of Eastern Africa, every friend of humanity must unite in the wish that this philanthropic explorer may succeed in accomplishing what Livingston had so deeply at heart, and to which he gave up the best years of his life. Mr. Young says: "The common people are rejoiced at our presence; for many miles around us slavery has ceased, as there are no Arabs brave enough to come near us."

The Rev. H. Waller, in commenting on Mr. Young's letter, drew attention to the fact that the southern end of Lake Tanganyika was now known to approach very closely to the northern end of Lake Nyassa, from which there was a clear water-way to the Indian ocean. He remarked that if the slave trade was to be confined within bounds it must be by the navigation of those lakes, and that many indulged the hope that more steamers would soon be found upon them. Commander Cammeron stated before the British Association that there would be no great difficulty in carrying a steamer from Lake Nyassa to Lake Tanganyika, and that it might be possible to introduce the steamer from the Tanganyika into the Congo, and carry it thence to

the coast. That, at all events, a connected service of boats from both coasts might establish a direct communication across Africa, which would protect traffic and put an end to the slave trade.

EAST AFRICA.

It will be remembered that Colonel Long, in descending the Victoria Nile, found that the river opened into a large lake called Lake Ibrahim, which he supposed to be about thirty miles long. Signor Piaggia, who accompanied Gessi to Magungo, on the Mwutan Nizige, ascended the Somerset river to M'rooli, and from thence, with a party of natives sent by King M'tesa, he continued his explorations and came upon a lake which he calls Lake Capechü which he found to be fifty miles long. Colonel Long, whilst in this city, received a telegram from Cairo announcing this fact, and told me that from the information received it was undoubtedly the lake he had discovered in descending the Victoria. He says Signor Piaggia found two rivers flowing into the lake from the north-east, which Colonel Long supposes to be the Asria and Saubat. Colonel Long says that the Victoria Nile is very transparent to Lake Ibrahim, and that as the river approaches that lake, the current is very slight, being kept in abeyance by the mass of vegetation in the lake. He found the lotus growing up in twenty feet of water, and spreading its broad leaves, two feet in diameter, over the surface. I regret that Colonel Long was compelled to leave this city for Egypt before the meeting of the Society, and that you had not the pleasure of hearing from our countryman an account of his labors in Africa.

The Rev. R. Price has made a journey from the coast of Zanzibar to Mpwapwa, on the way to Lake Tanganyika, and found a route to the interior highlands, which is free from the fever swamps of the old route, and from that great scourge of East Africa, the tsetse fly; a fact of great importance in the opening up of Central Africa.

An Italian expedition, under the Marquis Antonori, which has been fitted out at an expense of $20,000, started out last February for the exploration of the country on the east coast, between Shoa and Lake Ukerewe (Victoria Nyanza). Its entrance into the interior was delayed both by serious losses upon the journey outward and by difficulties with the local authorities on the coast. From an account recently received by the Italian Geographical Society, he had, after many hardships and delays, reached Liecè, the capital of Shoa, where he was hospitably received by the king, and is to make Shoa a base

for a scientific exploration of the lakes. The expedition is to be absent four years.

G. A. Haggenmacher succeeded, after endless conflicts and difficulties, in penetrating into the Somali country for 100 miles, when he was compelled to return, barely escaping with his life. This is the first attempt in this direction since Capt. Burton's expedition in 1854. Haggenmacher died shortly after his return. His journal and papers, which he succeeded in bringing back with him, are said to give a very complete account of the geography, industry and traffic of the country, as far as he went. Bishop Restell Cornish made a four months' tour in the interior of Madagascar, and visited many places where no foreigner had previously been.

I regret exceedingly to hear of the recent death of Mr. Rebman, the well-known missionary who first suggested the existence of a system of lakes in Central Africa, which was verified by the discoveries of Burton, Speke, Grant, Baker, Livingstone, Long and Stanley.

South Africa.

Very little, if anything, in the way of geographical discovery has occurred in South Africa. The diamond fields of the Orange Free State, and the gold fields of the Transvaal Republic have not only attracted the enterprising and adventurous who might otherwise have engaged in geographical explorations, but have involved these rising, industrious and prosperous African republics in difficulties which have proved anything but beneficial to them.

Transvaal Republic.

The Boers, the name by which the descendants of the Dutch colonists who settled the Cape of Good Hope are distinguished, and which, in the Dutch language, simply means farmers, being unwilling to live under English colonial rule in Cape Colony, migrated in large numbers northward, beyond the British limits, to an unknown country, where they founded the Orange Free State, and afterwards, to the north of it, the Transvaal Republic. An honest, simple and industrious race by whom nearly all the hard work in the colonization of South Africa has hitherto been performed, they found in their new home a fruitful and healthy region, which, under their patient industry, probity and thrift, was rapidly becoming, when these diamond and gold fields were discovered, one of the most prosperous, moral and desirable parts of Africa. The discovery at once attracted the cupidity of their English

colonial neighbors, who have ever since, through the colonial officials and otherwise, pursued a line of policy, the unmistakable object of which is to annex these young republics and convert them into British possessions. In utter disregard of the rights of the Orange Free State, the diamond fields, which have hitherto yielded diamonds to the value of fifteen millions sterling, were claimed by the English, and the only recognition of their rights that the colonists have been able to obtain from the British government is the payment of a comparatively small sum of money for giving them up. In the Transvaal, where the gold fields are situated, a different policy has been pursued. The natives, with whom the colonists have hitherto lived in amity, have been incited, by British officials and secret agents, to take up arms against them, and we read in English journals of the approaching dissolution of the Transvaal Republic through their war with the Kaffirs. This rising young African republic, the government of which has been carried on with marked intelligence and ability, has effected a loan in Holland for a railroad from its capital, Pretoria, to Delagoa bay, on the east coast, which has one of the finest harbors in Africa, the use of which for the railroad has been ceded by the Portuguese government for one hundred years. This railroad is now in the course of construction, and when finished will draw off the whole trade of the Transvaal from Port Natal, in the British Colony of Natal, which is now the only outlet of the Transvaal; and the evident design of stirring up the Kaffir war is to prevent the construction of this important work, and bring about such a state of things in the infant republic as will make its acquisition by the English little more than an easy act of taking possession. It is impossible not to feel, especially in this country, a strong interest in these young African republics; and should the Transvaal succeed in building its road to Delagoa bay, every measure should be taken for establishing, at the earliest opportunity, direct commercial intercourse between it and the United States, which would be maintained and augmented through mutual interests and a warm mutual sympathy.

NEW GUINEA.

An object of geographical interest, at present, is the great island of New Guinea, which, notwithstanding its magnitude, its fruitfulness and position in the great ocean highway in which it is placed, was thirty years ago put down in the geographies as *terra incognita*, or, as the geographer Murray expressed it, as "viewed only by navi-

gators at a distance." During the last five years it has been the scene of active explorations by Beccaria, D'Albertis, Moresby, Rosenberg, Maclay, the Russian explorer, and Macleay, the English explorer, Macfarlane, Stone and others.

It will be remembered that I mentioned in my last address that Miss Baxter, of Dundee, had given a steamer — the Ellengowan — for explorations in New Guinea. With the aid of this steamer, the Rev. Mr. Macfarlane was enabled to ascend the Baxter river for ninety miles, sixty miles only proving to be navigable. He, also, accompanied by the Italian naturalist, d'Albertis, who has done so much in the exploration of New Guinea, explored the Fly river in this steamer. They found the river five miles wide at its entrance, and that it widened after they had gone ten miles. They sailed up it to a distance of 150 miles, passing many beautiful islands, and thought it probable that they might have gone 100 miles further, the river still stretching away to the north-west, broad and deep at the point where they stopped; but the rainy season was approaching, their provisions were getting short, and the Europeans had become dropsical. "Our legs," says Mr. Macfarlane, "were like putty — would take any impression; and the mosquitos and other insects were a terrible pest and devoured us, although we washed ourselves from head to foot in kerosene."

In the first 100 miles of their course up the river, they found its shores thickly peopled by a mixed race, Papuan and Malayan, speaking different dialects and at war with each other, and found them to be an intelligent, brave and energetic people. As the explorers first ascended, the natives came on board and were friendly, but at a point further up they were hostile, gathering in large numbers in their canoes, and would have attacked the vessel fiercely had they not been fired upon, when they paused and then suddenly retreated; their canoes, says Mr. Macfarlane, flying back over the calm surface of the water as if their inmates were pulling in a regatta. The whole country through which they passed was low and swampy, and from the point to which they ascended, as far as they could see, it continued to be so.

Upon their return the natives were again hostile. As they approached a large village, one of the houses of which was about 500 feet long, the natives followed them with their canoes, and it being evident they meant to attack, a charge of dynamite was thrown overboard with a long fusee, which exploded as the canoes approached it.

When the natives felt the shock and saw the water bubbling up about them, they appeared utterly bewildered. Those standing up dropped as if they had been shot, and none of them ventured to pull another stroke for fear of being blown into the air or engulfed in the sea, which proved a fortunate check, as the vessel shortly after got aground. The next morning the natives approached the vessel unarmed and a friendly intercourse took place, presents being given them, in exchange for which they returned with an ample supply of provisions. They afterwards came on board, and went over the steamer without the slightest sign of fear except on the part of one of them, when he found himself suddenly before a large looking-glass.

"We have proved," says Mr. Macfarlane, "by this expedition, that there is in this part of the island a large navigable river, extending far into the interior."

Last August d'Albertis, in a small steamer, started upon a new expedition to the Fly river, and ascended it, it is said, 350 miles, but could not communicate with the natives, whom he found to be numerous and hostile. His object was to trace the river to its source, and then to cross the country to Port Moresby. Recent intelligence received is that he has now returned, and has fully explored the river. Miclucho Maclay, who has made extensive explorations in New Guinea, was engaged last July in explorations on the north-east side of the island about Astrolabe bay, the part of the coast which has been named after him; and he reports that in April an earthquake occurred in the highlands in that vicinity, which destroyed many villages.

The Rev. George Brown, a missionary, visited the islands of the north-east coast of New Guinea. He describes the natives as nude savages of the oriental negro type, who live more like beasts than human beings. He found cannibalism prevailing throughout the islands, not, as among some other savages, as a religious rite, but as a means of subsistence. He has given the details of what he saw of this horrible practice, which are too revolting to repeat. He says he was assured by the natives that there was in the islands a race of human beings with tails, who were not monkeys; that the tail was bony and inflexible, so that those with this caudal appendage had to dig a hole in the sand before they could sit down, as they died if the tail was broken. We have thus revived the account of the men with tails heretofore reported to exist in Borneo and the interior of Africa,

but always upon native information, with the exception of hearsay information alleged to have been given by a sailor cast away on the coast of Borneo, and, like all such information, of little value.

Mr. O. Stone explored certain portions of the southern peninsula of New Guinea, the entire shore of the Papuan gulf, and the neighborhood of the Baxter river, for a hundred miles inward. He found the country watered by the Baxter low and swampy, covered with forests of mango trees, and thinly populated; in this respect contrasting strongly with the Fly river, ascended by Macfarlane and d'Albertis, which for sixty miles from its mouth swarmed with human beings. The Malayan population of the eastern shore, he says, are far above the savage, intellectually and morally, and are opposed to the polygamy and cannibalism which exist among the Papuans.

As Mr. Stone and his party approached the great central backbone of the peninsula, a lofty range of mountains running north and south, they found, at a height of 4,000 feet, dense forests of tropical vegetation, tall trees, and an undergrowth which covers the whole northern range, except the top of Mount Owen Stanley which rises in a double peak to 13,205 feet.

Only one gap or opening was seen in this imposing mountain range, which rises to a height of 8,000 feet. Owing to the frequent rains in the mountains, the soil is very rich; sugar canes, yams and sweet potatoes attaining an immense size. Bread fruit and mango are indigenous, and tobacco cultivated in the interior; with a terrace system of irrigation, rice, he says, may be cultivated, and on the open land the cotton tree is found. The people are of a brighter color than those of the Fly river, and not so warlike. He found them inoffensive, friendly, even jovial, and very different from the sullen, apathetic Malays. They have frizzled hair and are darker than the Malays. The woman take an active part in any disturbance, and were found more capable of making a hard bargain than the men. None of the tribes believe in a God, although attributing every thing extraordinary to some supernatural agency.

The climate of this part of the peninsula, he states, is relaxing. It is impossible to live in the valleys without impairing the constitution from the excessive moisture; but in the interior it is more salubrious. Birds are very numerous, conspicuous amongst which is the bird of paradise, but flowers are scarce.

Mr. Stone's general opinion was that the west coast would prove a grave to Europeans, but that the eastern portion of New Guinea was,

on the whole, favorable to cultivation; that it possessed great mineral wealth, and offers sufficient inducements for colonization; but would require much prudence and consideration, owing to the peculiar character of the country and the circumstances of the people.

D'Albertis, who has had much more experience than Mr. Stone and knows much more of the country and people, recommends the Dutch method of colonization instead of the English. The Dutch, he says, civilize the natives, but the English supplant them. He describes the natives of New Guinea generally — and he has had large opportunities for observation — as an intelligent, industrious and docile people, capable of development.

Signor C. E. Cerruti has been exploring in north-west New Guinea and thinks that before long it will be occupied by some civilized nation. He describes the island as covered with a vegetation unsurpassed in luxuriance in any part of the world. "Cattle and sheep," he says, "can be easily raised over a land now wasted by about 50,000 savages."

D'Albertis and Cerruti's information is very encouraging in respect to this large and fruitful island, which is 1,400 miles long and from 450 to twenty miles wide, and may become in the future the seat of an important civilization.

A journal kept by the Rev. Mr. Loes, in New Guinea, during a voyage from Port Moresby to the Chinese straits, has been published in the London Times. At Hood's bay he sailed up a considerable river, and near the coast found a large village, laid out in streets and squares, scrupulously clean, and also carefully cultivated flowers. He saw the natives hewing canoes of large size and excellent make with stone hatchets, and at Cape Rodney, upon a lagoon, he saw a regular lake village, the habitations being supported by piles, like those lacustrian villages the remains of which were found some years ago on the borders of Swiss lakes.

The Rev. J. Macfarlane, in the *Ellengowan*, in the course of the year, examined the coast east of Yule island, and found a town of 2,000 inhabitants called Kerepunam, the people of which showed a remarkable advance in civilization, living in well-built houses with carefully cultivated gardens, and, like the village seen by Mr. Loes, it presented the pleasant spectacle of well swept streets. From Amazon bay to the Chinese straits the people were found to be more numerous, intelligent and healthy than in other part of New Guinea.

It is reported at Port Moresby and along the coast that there is a

village inhabited by women somewhere near Amazon bay, which probably suggested the name of the bay.

AUSTRALIA.

Mr. E. Giles, to whose labors I have so frequently referred, has returned after an exploration of that portion of the Australian continent lying between Murchison and the overland telegraph line. He traced the Ashburton river to its sources, thus defining the extent and position of the western water-shed, which abuts on the desert in 120° 20′ E. long. From the Ashburton he proceeded as far as the twenty-third parallel. No water-courses were found flowing to the eastward, and he journeyed along the twenty-fourth parallel to 127° E. long., and found the country an open desert.

NEW ZEALAND.

From the result of researches made by Prof. Haast in caves in New Zealand, it would seem that an enormous length of time must have elapsed since the extinction of the moa, the gigantic bird of New Zealand.

CONCLUSION.

I have thus given, though very imperfectly, a survey of the geographical work of the world during the last year, and regarded as the work of a single year I think it justifies what I said in my last address — that we are living in a great geographical age.

A DOG-SLEDGE JOURNEY IN KAMTSCHATKA AND NORTH-EASTERN SIBERIA.

By GEORGE KENNAN.

Until he has camped out with the Tartars of Turkestan, eaten tallow and reindeer's entrails with the wandering tribes of Northern Asia, and hung his hat in token of discovery on the North Pole, he cannot complain that he has exhausted the world in which he lives.

Few parts of the globe, and few races of men at the present day, are less known to science, to literature, and to the civilized public generally, than the vast plains of North-eastern Siberia, and the wild tribes of natives who wander with their herds of reindeer from the Okhotsk sea to the low wind-swept shores of the Arctic ocean.

This vast territory, equal in extent to all of the United States east of the Mississippi river, has been known to the Russians and nominally owned by them for nearly 200 years, but in spite of all their efforts to settle and colonize it, is little better known, and is certainly no more densely populated now than it was when Peter the Great founded the present Russian Empire, in the latter part of the seventeenth century. Now and then an exploring party has partially surveyed its sea coast, or a few adventurous Cossacks have pushed their way on dog sledges through the snowy solitudes which lie in its interior, but their vague and indefinite reports have added little to our stock of information, and have never been of such an encouraging character as to induce any further settlement. The expedition of the Russian Admiral Vrangell, in 1821, did more, probably, to acquaint the world with North-eastern Siberia, than all the attempts of his predecessors together, and his travels are the only account which we have in the English language of the character and people of that far distant land.

In 1864, when the Western Union Telegraph Company first projected a line from America to Europe by way of Behring's straits, little or nothing could be learned as to the nature of the country through which it would pass. It was known to be cold, barren and desolate, and inhabited by wandering tribes of hostile natives; but

more than this the Russian government itself could not tell us. Many of our most intelligent and best informed geographers seriously thought and said that the construction of the proposed line through Siberia was just as impracticable and visionary as a broad-gauge double-track railroad to the moon, and not a few of our most prominent papers throughout the country declared that the will of God must be made subject to the will of man before such an enterprise could succeed. Undisturbed, however, by these discouraging remarks, the company began and steadily continued its preparations, and in July, 1865, its first exploring party sailed from San Francisco, Cal., for the Asiatic coast.

Of this party I was fortunate or unfortunate enough to be a member. It consisted altogether of only four men, and its size seemed rather out of proportion to the extent of its field. But we were not expected to do much more than gather information about the country until we should be reinforced on the following year.

On the twentieth of August, after forty-seven days of monotonous sea life, we landed in the little Russian seaport at the southern end of Kamtschatka, and entered eagerly upon our first experience of Asiatic life. Every one has felt, I suppose, in a greater or less degree, the sensation of strangeness which a new place, seen for the first time, always awakens, but it can hardly be imagined with what eager curiosity and freshness of impression we saw every thing in this far distant, unvisited corner of the world. The little log-houses, with their fish-skin windows and huge brick ovens, the men and women dressed for the most part alike, in tanned deerskin, the priests who walked about the streets in their long, black robes, with their hair hanging nearly to their waists, the wooden frames everywhere filled with thousands of drying fish, and the howling of two or three hundred half wild dogs, were all evidences of a new and strange country.

The village of Petropavlovski, the largest and most important Russian settlement in the peninsula, is situated in a little valley at the head of Avatcha bay and possesses many features of wild, romantic beauty. High hills, covered with clumps of silver birch, and fragrant with thousands of wild roses, sweep round it in a great semicircle, and throw into picturesque relief the red roofs of the low houses and the green swelling domes of its little Greek church. Between the hills, in the far blue distance, rises the snowy cone of the Roselskoi volcano, whose banner of golden smoke guides the sailor to port while yet an hundred miles at sea. The little log cot-

tages, embosomed in trees, and the surrounding hills, covered with wild flowers and green with luxuriant vegetation, were suggestive of any thing but the cold semi-Arctic climate of Kamtschatka, and never were northern travelers more agreeably disappointed than were we, to find in that much abused country the weather, scenery, and vegetation of the temperate zone.

Almost the first thing which a traveler notices in any foreign land is the language, and it is especially noticeable in any part of Siberia. What the Russians did at the tower of Babel to be afflicted with such a complicated, contorted, utterly incomprehensible language, I have never been able to conjecture. I have thought, sometimes, that they must have built their side of the tower higher than any of the other tribes, and have been punished for their sinful industry by this jargon of unintelligible sounds which no man could possibly hope to understand before he became so old that he never could work on another tower. However they came by it, it is certainly a thorn in the flesh to all travelers in the Russian empire.

Some weeks before we reached Kamtschatka, I decided to learn, if possible, a few common expressions which would be useful in our first intercourse with the natives, and among them the phrase, "I want something to eat." I thought that this would, probably, be the first observation which I should have to address to any of the inhabitants, and I determined to learn it so thoroughly that I should never be in danger of starvation from ignorance. I accordingly asked our interpreter what the equivalent expression was in Russian. He very coolly replied that whenever I wanted any thing to eat I must say *Vashaveleekeevveesokeeblagarodiaprevoskhodeetelstro.*

This was enough. It convinced me that if I were compelled to ask for food in that language I should inevitably starve to death — I would not be able to get one meal a month, or if I did I should have no jaws or facial muscles left to eat it with after getting it.

Another of our party, in making similar researches into the nature of the language, discovered that the Russian words for mother and brother were *mat* and *brat;* and he at once declared that any language which made him call his mother a mat and his brother a brat, was too disrespectful for him to learn.

Reasoning from analogy it might fairly be inferred, that if mother were *mat* and brother, *brat*, father should be fat, and we speculated curiously on the probability of little Russian urchins calling their father fatty instead of papa, as an endearing nickname. We soon

learned, however, not to draw any conclusions from the supposed regularity of the language; there was nothing regular about it Every thing was bottom side up or wrong end first. "Father," instead of being fat, as we supposed, was *ottets*. *Bob* was the word for woman, *zhow* meant a wife, and *you be righteous*, was the Russian expression for "get out." *

The Russian language is much more difficult of acquirement than any of the native languages of Siberia on account of its involved and complicated grammar. All its words are very much inflected, its nouns having no less than forty-two terminations.

The labor which is required to learn forty-two different endings for every word can hardly be imagined. In the short time which we spent in Petropavlovski, we succeeded in learning the Russian for "yes," "no," and "how do you do," and we congratulated ourselves not a little upon even that slight progress in such a heathen tongue. Bush, with his usual regard for polite forms, wished, also, to learn to say thank you, but he abandoned the idea upon discovering that "thank you" in Russian was *Ya pakorno vass blagadorvo millostovwe gossoodar* Politeness in such a language as that is simply impossible. We were obliged to caution Bush several times not to indulge too freely in such rhetorical flourishes, for if he did it was extremely probable that we should have to bury him there in Kamtschatka, and write upon his

* I was once assured by a Russian Cossack in Kamtschatka, that his language was the original language in the world. All other tongues, he said, dated from the tower of Babel, but Russian was spoken by Adam and Eve in the garden of Eden. I told him I had never heard of this rather singular fact, and that I had always supposed that it was the American language which was spoken in the garden of Eden, and that Russian was a barbarous jaw-breaking dialect which God inflicted upon Cain to punish him for the murder of his brother. The poor Cossack stood aghast with horror at my explanation of the origin of his beloved language. He finally recovered himself, however, and said that he had no doubt that the American language was a very old one, but he thought I must be mistaken about Russian because very ancient traditions ascribed the invention of that language to Adam and Eve, and he appealed to Dodd to know if it were not so. Dodd, to my great astonishment, said he thought it was, because it explained some things which he had never understood in the Bible account and which could not be explained upon any other supposition than that Russian was spoken in the garden of Eden The Cossack brightened up at this reinforcement and inquired cheerfully what these things were. "Why," said Dodd, "I have always wondered why Adam took the apple when Eve offered it to him, but I don't wonder at it now. It would have taken him longer to tell Eve, in Russian, that he didn't want it, than it would to eat all the apples on the tree, so he chose the least of two difficulties and I don't blame him a bit."

The Cossack concluded that we were prejudiced against his language and dropped the subject in disgust.

lonely tombstone the mournful epitaph, "Found dead with a long Russian word sticking in his throat."

During our stay at Petropavlovski, we had an opportunity of seeing the Russian marriage ceremony as it is performed in Siberia, and for the especial benefit of the ladies, who are supposed to be particularly interested in such matters, I will try and describe it, although I must say that to describe a marriage ceremony properly, including what the bride had on, requires a special and technical education. The preliminary arrangements, by which I mean falling in love and popping the question, are made in Siberia very much as they are in any other part of the world, with one noticeable exception. The young man does not pop his own question, but appoints some obliging friend to do it for him. This friend is then known as the thousandth man, and besides proposing for the lady's hand he is obliged to pay all the expenses of the wedding. As these amount sometimes to a considerable sum, the position of thousandth man is not so desirable as a good post-office, and, so far as my experience goes, it is not very eagerly sought after. It is considered a point of honor, however, not to refuse to act in this capacity, and however poor a man may be, he generally contrives to get a fox skin or a few roubles to pay for his friend's marriage. Why this unfortunate victim was called the thousandth man, I was never able to learn, but I presume the title grew out of the fact that not more than one man in a thousand was willing to pay for somebody else's happiness, so that he was literally the thousandth man. In America I'm afraid such a model of disinterested benevolence wouldn't be found short of the ten-thousandth man.

When this thousandth man has been appointed and the proposals for the lady's hand made, it becomes the duty of the bridegroom to buy his bride. About half an hour before the ceremony at the church is to begin, the young man seeks an interview with the lady's father and makes an offer of a certain sum of money for his daughter's hand. The money, whatever it be, is accepted, and the young man and woman in their bridal costume set out on foot for the church, attended by an escort of twenty or thirty yelling boys. The price usually paid for a wife, I am sorry to say, is seldom more than ten cents; but I would not have it inferred that ten cents is all a wife in Siberia is worth. The lowness of the price shows more accurately what the young man is worth, and as the purchase and sale are merely a form, it is intended to be within the means of the poorest

native who may be matrimonially inclined. At the church both parties are given three lighted candles tied together with blue ribbon, and as they advance to the altar the priest begins in a low, monotonous voice the marriage ceremony. In a few moments he takes up a bottle filled with something which is supposed to be wine and administers a teaspoonful to each of the contracting parties. More reading and chanting follow, and at last a couple of dusty gilt crowns which an assistant brings from the church treasury are placed upon the heads of the bridegroom and bride, and they follow the priest in a slow march around the altar. At the end of the third round the ceremony is finished, and after the usual congratulations the newly-married couple visit in turn their respective parents. At the home of the bride a loaf of black bread is prepared and sprinkled over the top with salt, and when the couple make their appearance they kneel before the shrine in the corner of the room and the sign of the cross is made with the loaf of bread over their heads. This is the parental blessing, and is supposed to insure them against future starvation. It doesn't always attain that desirable result. At the conclusion of these visits the bridal party, together with all the invited guests, partake of the marriage supper, which is usually prepared at the house of some intimate friend. On the occasion to which I refer the supper was given by the Russian governor, and we, as distinguished foreigners, were, of course, invited. The hour, six o'clock, was rather an early one, but the room when we arrived was well filled with the Russian merchants, Cossacks and citizens of the place. It was expected, of course, that the distinguished Americans, of whose politeness, intelligence and suavity so much had been heard, would congratulate the bride, but the *distinguished* but *unfortunate* Americans didn't know how to do it. Our acquirements in Russian, as I have before said, were limited to yes, no and how do you do, and none of these expressions seemed exactly suited to the occasion.

Desirous, however, of sustaining the national reputation for politeness, we selected the last of these phrases as the most appropriate, and marching solemnly up, asked the bride, with a very low bow and in very bad Russian, how she did. She graciously replied "*Cherazvvechiano blagopoloochna pakornashae vass blagadoroo*," and the distinguished Americans retired with a proud consciousness of having done their duty. We were not much enlightened as to the state of the bride's health, but judging from the facility with which she rattled off this tremendous sentence we presumed that she must be

well. Nothing but a robust constitution and the most excellent health would have enabled her to do it. In course of time the assembled party seated themselves at the table, the bride and bridegroom taking the head, and both eating with one knife and fork out of the same plate. We were just getting into the merits of the supper when one of the Russian merchants rose to his feet, and drinking off a glass of wine, exclaimed in a loud voice *Ghorka!* which means in English "sour." We thought that this was a very curious kind of a toast, and wondered whether the poor Russian couldn't think of any better sentiment than that for a marriage supper. If he couldn't we proposed to help him out. We didn't understand the language very well ourselves, but we could ask the bride again how she did, and that would be better than telling her that her cup of happiness was sour. What was our astonishment, however, to see the bridegroom suddenly drop his knife and fork, and throwing his arms around the bride's neck salute her with a loud ringing smack. This was a new feature in the entertainment, and it seemed more remarkable than any thing which had preceded it, but upon being assured that it was all right and a time-honored custom, we resumed our supper wondering what would come next. Presently the cry of Sour! was again raised, and again the bridegroom kissed his lady, and as if the ice were now fairly broken, cries of Sour! began to come from all parts of the table, and the frequent necessity of kissing the bride seemed to interfere very seriously with the young man's supper. Presuming from its constant repetition that this cry of *Ghorka* was a duty which every guest owed to the bridegroom, one of our party determined that he would not be behindhand in its performance. He would show these Russians that he understood their rather peculiar etiquette better than they did themselves. Being unfamiliar, however, with the language, and somewhat embarrassed by the novelty of his position, he made a slight mistake in the word, and instead of saying sour, as he intended, shouted at the top of his voice Vinegar! To counteract the effect of such an intensely sour expression as this, the bridegroom was compelled to kiss the bride three several times amid great applause. The evening after supper wore away in eating and drinking, and about midnight the party broke up in a state of general intoxication. Thus ended our first experience of social life in Kamtschatka, and it was a very fitting introduction to the curious scenes and customs which we were yet to witness.

We remained in Petropavlovski altogether about two weeks gather-

ing information relative to the country, and making preparations for our northern journey. It was decided to separate at this point into two parties, Bush and Mahood going by water to the mouth of the Amoor river, on the Chinese frontier, and the major and I, with a young American named Dodd, starting north through Kamtschatka. The season was already advanced for that high latitude, but we hoped that early in the winter we should reach the Russian settlements of Ghijiga, at the head of the Okhotsk sea, from which point we intended to push our explorations northward to Behring's straits, and westward until we should meet Lieutenants Mahood and Bush.

The peninsula of Kamtschatka is about 800 miles in length and is almost entirely of volcanic formation. It is divided throughout nearly its whole extent by a range of rugged mountains from 3,000 to 12,000 feet in height, which, with their numerous spurs and foot-hills, give a great variety and picturesque effect to all its scenery. The population of the peninsula is about 5,000 and is made up of three different classes, the Russian, the Kamchadals or settled natives, and the wandering Koraks. The Kamchadals, who compose the most numerous class, are originally descended from some of the weaker Tartar tribes of Central Asia, but they have almost entirely lost their distinct nationality by intercourse and intermarriage with the Russians. They have adopted the Russian language and religion, live in log-houses instead of tents and cultivate the soil, all of which things are directly contrary to the taste and feeling of every true Siberian native. They are very peaceable and quiet in disposition, generally honest and truthful in all their dealings and extremely hospitable to strangers. The government under which all the inhabitants of Kamtschatka live is administered by a Russian officer called an Ispravnik or governor, who settles all questions of law which arise between individuals or tribes, collects the yearly tax of furs which is levied upon every male inhabitant, and exercises a general discretionary supervision over the whole province. The principle source of the natives' wealth is the trade in sables which, in Kamtschatka alone, amounts annually to about $90,000. Sable trapping, fishing and the cultivation of rye and potatoes, are the occupations of nearly all the Kamchadals, who are settled in little log villages throughout the peninsula, on all the rivers which fall into the Okhotsk sea or the Pacific. To assist us in our journey through these native settlements, the Russian governor sent a special courier in advance to notify the people of our coming and to direct them, upon pain of severe punishment, to remain at their

homes until we should pass, and to furnish us with any required number of men, horses, boats or dog-sledges. Thus prepared we set out on the fourth of September for the far north.

Our horseback ride through southern Kamtschatka, was the very poetry of out-door life. The climate was almost Californian in its clearness and warmth, the vegetation everywhere was just dying into the glowing crimson and gold of September, and the grand mountain scenery was that of Switzerland. Day after day we rode through broad grassy valleys which seemed lulled to sleep in the warm sunshine by the music of drowsy grasshoppers, or between high majestic mountains whose summits were white with perpetual snow, and whose bases were aflame with the orange and scarlet foliage of autumn. Herds of timid reindeer dashed off with startled bounds at our approach, wild mountain sheep looked down from some inaccessible crag upon our long train as it filed through the mountain ravine below, and now and then a bear, roused from his afternoon nap in the sun, galloped awkwardly away from under our very horses' feet. The unbroken wilderness, lonely and still as when it came from the hand of its Creator on the first great Sabbath, showed no traces of man's existence, and we could not help feeling all the pride and satisfaction of first discoverers. Kamtschatka had put on for us its gala dress, and the bright colored leaves which fell through the warm, still air upon our heads, as we rode under the forest trees, were nature's leafy offering to the first of her admirers who had sought out, in this far distant land, her long hidden wealth of beauty. Nothing surprises the traveler in Kamtschatka so much as the wild, picturesque beauty of its scenery, and the luxuriant character of its vegetation. He anticipates the biting air and frozen plains of Labrador, but he realizes, instead, the mild climate and beautiful scenery of the fabled Atlantis. In sight of eternal snow, he rides through wild grass which sweeps his waist, and by bending from his saddle can pick his arms full of lillies, larkspurs and wild roses. I do not wish to convey too favorable an impression of Kamtschatka, but its very name has always been synonymous with every thing cold, barren and desolate, and it is time the much abused country had some kind of justice. Its cold and desolation, in winter, are undeniable facts, but no one who has traveled through the peninsula in summer will question the beauty of its scenery. The weather, as we advanced to the northward, grew steadily colder, and we did not long enjoy the warm, clear skies, and

beautiful scenery which I have tried to describe. The bright colors of the autumn leaves faded into dead brown, the sky became overcast with heavy leaden clouds, and the keen northern wind, as it passed, moaned out in the tree-tops its gloomy forebodings of approaching winter. On the first of October we were 500 miles north of Petropavlovski, and straining every nerve to reach the Russian settlement of Ghijiga, at the head of the Okhotsk sea before an Arctic winter should block up the mountain ravines with snow. We were, however, too late. One hundred and fifty miles north of Lesnoi, the last Kamchadal settlement in the peninsula, in the very heart of a wilderness of mountains, we were overtaken by the opening storm of winter. Losing our way in the blinding snow, chilled to the bone by the bitter wind, which froze our wet clothes into a stiff, crackling armor of ice, and exhausting our provisions until nothing remained but a few crumbs of bread and a little piece of blubber, we were reluctantly compelled to turn back. Three days of suffering, during which we lived upon pine seeds and water, brought us again to Lesnoi, where disappointment, fatigue and exposure, brought a severe fit of illness upon the leader of our party. This unexpected misfortune put a stop to our further progress. For more than a month we were compelled to live in the low, dirty log-huts of the natives, with nothing but an occasional day of pleasant weather to relieve the monotony of our lives.

Early in November the weather became colder and more settled, snow fell in sufficient quantities to make good sledging, and as our leader's health was partially restored, we determined to make another effort to reach Ghijiga. Collecting, from all the surrounding settlements, about 200 dogs, which we divided into sixteen teams, and providing ourselves with forty days' provisions, we set out, with lighter hearts than we had known in many a day, for the territory of the wandering Koraks.

The Koraks, who compose one of the largest of the Siberian and Kamtschatkan tribes, are essentially a wandering people. Living in skin tents, and owning herds of from 1,000 to 12,000 reindeer, they move from place to place with the greatest facility, and perhaps in the whole course of their lives do not camp twice upon the same spot. That portion of the tribe which wanders in Kamtschatka is divided into forty or fifty different bands, composed of six or eight families each, and owning an average number of 3,000 reindeer to each band. They select for their wandering ground the barest,

bleakest, most desolate plains in all Siberia, where the white Arctic moss which constitutes their reindeers' food grows in the greatest abundance.

A herd of several thousand deer will, in a very few days, paw up the snow and eat all the moss within the circle of a mile from the encampment, and then, of course, the band must move to fresh ground. Their wandering life, therefore, is not a choice, but rather a necessity, growing out of their dependence upon the reindeer. They *must* wander or their deer will starve. These scattered bands of Koraks, although constantly in motion, keep up an irregular communication with each other, and one band generally knows where the next is to be found. We proposed, therefore, to travel through this region upon the reindeer sledges of this tribe, hiring them with tobacco and beads to carry us from one of their encampments to another until we should reach our destination.

Late one moonlight night, on the sixth day, after leaving Lesnoi, we came suddenly upon the first encampment of this wild, nomadic people, and our wolfish dogs, crazy with excitement, dashed down at a gallop upon the vast herd of reindeer which stood still and peaceful around the black tents.

In an instant the quiet encampment was thrown into the wildest confusion. The reindeer, with hoarse, startled barks, broke into a frightened stampede, scores of dark forms issued suddenly from the tents, and grasping long, bright, pointed spears, threw themselves in our way, capsized sledges with their shouting and cursing drivers were dragged between the tents by the excited dogs, and a perfect pandemonium of discordant sounds broke the calm silence of the winter's night. Never before, I fancy, had a band of travelers descended so like a sudden tornado upon a Korak encampment, and we feared that the surprised natives would spear us before we could explain who we were and what we wanted.

The dogs, however, were finally stopped and beaten into submission, the reindeer were again gathered together, and, under the guidance of a tall, shaven-headed Korak, we entered, for the first time, a native tent. Crawling cautiously on hands and knees through a long, dark, tunnel of skins, we lifted up a heavy fur curtain and found ourselves in a large conical tent, about thirty feet in diameter. A bright fire of pine branches was burning on the ground in the center and around it were squatted half a dozen native women, with smoky tattooed faces, watching a steaming kettle of food. The

smoke, which went everywhere else before it escaped through the roof, made it almost impossible at first to see or breathe, and we threw ourselves on the ground, with our faces down, to get a breath of pure air.

The tents of the Koraks vary from ten to forty feet in diameter, but they are all constructed in the same simple way, by stretching a covering of reindeer furs over a conical frame-work of poles. As it is impossible to warm so large a tent by one fire on the ground in the center, they construct, around the inner circumference, a series of small tight skin apartments, called *pologs*, which are about six feet square and four feet in height, separated one from another by heavy skin curtains. These pologs are warmed and lighted by a rude lamp of blubber and moss in a shallow bone or iron dish, and as little or none of the heat can escape the temperature is generally high enough to be entirely comfortable.

In the confined smoky atmosphere of these skin boxes, the Koraks spend nearly all their indoor life. Upon the general principle of doing in Rome as the Romans do, we often slept in these pologs, but we never closed our eyes without a well-founded expectation of being suffocated before morning.*

As soon as the Koraks learned, through an interpreter, our business and wants, they treated us with the greatest hospitality. Supper, if such a meal can be called by that civilized name, was soon prepared, and, seating ourselves upon the ground before a long wooden trough, with an ill-conditioned dog at each elbow to dispute our right to every

*The wandering natives of Siberia, contrary to all our preconceived ideas, we found to be tall, athletic, well-formed men, often more than six feet in height, with bold dark features which reminded us of our own North American Indians. They have not, however, a single trait in common with them nor with the Esquimaux of Labrador and Greenland. Physically, morally and intellectually they are a much finer race of men than the latter, and their honesty and generosity distinguish them sufficiently from the former. Although they are generous and hospitable to strangers, they repel instantly and with the greatest courage, any attempt to reduce them to subjection. They have always resisted the Russian invasion of their country; they have twice captured and burned the Russian settlement of Anadyrsk, and their indomitable bravery in every battle has been more than a match for the firearms and discipline of the Siberian Cossacks. Taught by repeated defeats that they could not impose their religion or their taxes upon these free Arabs of the Siberian desert, the Russians have finally concluded to let them alone, and after nearly two centuries of warfare, the Tchucktchis and most of the Koraks still retain their independence and show their distrust of the Russians by trading with them only at the point of a spear. There is not a single mean or treacherous feature in the character of the wandering natives, unless it has been planted there by intercourse with the Russians. Members of our party, alone and unarmed, have traveled frequently throughout their territory.

mouthful, we began an examination of Korak food. It is a very good plan, in partaking of the hospitality of the Siberian natives, to imagine that you are about to eat the worst thing you know of, and then to shut your eyes and swallow it quick. By so doing you may succeed in making a satisfactory meal; but you never will if you insist upon a critical examination of every thing beforehand. Above all, as you value your peace of mind, ask no questions. Ignorance in such cases is always bliss, and if you eat first, and ask what it is made of afterward, you are sure of your supper, whatever may be your subsequent reflections. If, on the contrary, you begin by asking questions, you are sure to end by going hungry, or what is, perhaps, as bad, by losing your appetite entirely. The application of these remarks may be learned from the fact that the national dish of the Siberian natives is made of blood, tallow, and the contents of the reindeer's stomach, taken out after the animal has been killed, and mixed up with dried grass into a thick, dark colored pudding. It is not very pleasant to think that you are eating half digested moss which some reindeer has eaten once before, and for that reason it is very desirable not to know any thing about it. We were unfortunate enough to see the curious mixture prepared, and from that very moment we lost the last vestige of appetite. We tried to persuade the major that it was his duty, in the interest of science, to taste it, and tell the world what it was like, but he said he felt no interest in scientific inquiries of that kind, and that when he wanted to eat moss he proposed to do it without the reindeer's assistance. The particular merits which the natives claim for this mixture are its medicinal properties. It corrects, they say, the bad effects of an exclusively meat diet, and takes the place, to a certain extent, of vegetables. A delightful substitute it makes for potatoes and cabbages. It can be imagined, perhaps, what their usual diet is, when blood, tallow and moss are taken as wholesome correctives. We decided, after some consideration, to suffer the bad effects of a meat diet rather than make use of such a remedy, and determined to suggest to some heathen reform society that they would do well to send a cargo of Drake's Plantation Bitters to this benighted land. The Koraks live almost entirely upon reindeer meat, tallow, marrow, blubber and dried fish, and know nothing whatever of the uses of salt.

We had hardly expected to find in Siberia any thing like alcoholic liquor, and were very much surprised one day to see a couple of natives reeling about in an advanced stage of intoxication. We knew that there

was not a drop of liquor in all Northern Kamtschatka, and were puzzled to know how they had become so thoroughly, hopelessly, undeniably drunk. The problem which civilization had so long studied, how to make a man drunk in the shortest possible time, and in the most effective way, they seemed to have solved at once. Upon inquiry, we learned that they had been eating toad-stools. There is a species of poisonous fungus growing in Siberia known to the natives as *muckamoor*, which possesses in a high degree intoxicating properties, and it is eaten more or less by all the Siberian tribes. Taken in large quantities, it is a violent narcotic poison, but in small doses it produces all the effects of alcoholic liquor. It has a most destructive effect, however, upon the nervous system, and the reaction when it comes prostrates the man mentally and physically. The Russian government is trying to check the progress of the terrible habit by making it a criminal offense to use or sell the plant in any shape, but they have not met with much success. The natives will get it and eat it in spite of all laws of the government. It is rather laughable to think that a convivial Korak when he wishes to treat a friend does not say won't you have a drink, but won't you come in and take a toad-stool. It does not seem to us like a very enticing invitation, but it has a magical effect upon a dissipated Korak. During our twenty days travel with the wandering tribes, we had an opportunity of seeing many of their strange and curious customs and habits, but I have only time for a brief description of their religious and marriage ceremonies, which are probably the most peculiar features of their social life.

Their religion is little more than the worship of the devil. If they have any idea of a benevolent God, it is that of a subordinate spirit whose chief characteristics are weakness and a sort of passive virtue. The Evil Spirit is the controlling power in heaven and earth, and his favor they seek to obtain by sacrifices and offerings. Whenever any great calamity, such as sickness, storm or famine comes upon them, it is attributed to the Evil Spirit's displeasure, and they at once consult their *shamans* or priests as to the best method of appeasing his wrath. The priest, to whom application is made, assembles the band in one of the largest tents, puts on a long robe stamped with figures of birds and beasts, and curious hieroglyphic emblems, unbinds his long black hair, and taking up a *baraban* or native drum, begins to sing a low monotonous chant to the accompaniment of slow, steady drum-beats. As the song progresses it increases in energy and rapidity, the priest contorts his body into the most unnat-

ural shapes, rolls his eyes wildly in his head and seems to go into a frenzied trance. Finally he springs to his feet, and jerking his head convulsively until his long hair fairly snaps, he begins a frantic dance about the tent. In a few moments he sinks apparently exhausted into his seat, and delivers to the awe stricken natives the message which he has received from the Evil Spirit, and which generally consists of an order to sacrifice a certain number of dogs or reindeer, or perhaps a man, to the offended god. These commands are generally obeyed, but sometimes the natives themselves seem to doubt the priest's pretended inspiration, and whip him severely to compel him to change his decree. If he still holds out without showing any signs of suffering or weakness, it is considered a proof of his sincerity and character as a genuine shaman. This custom of whipping a priest to test the sincerity of his profession is peculiar, I believe, to the Siberian natives, and it is a very curious illustration of the mingled superstition and skepticism of their character. They don't give a priest the benefit of any doubts. If they think he is a humbug they whip him until he owns up, or until they are satisfied that he is sustained by supernatural power. If the spiritual directions of a priest suit them, well and good; if not they whip him until he gives them others which are better suited to the occasion,— a very summary way of settling theological difficulties. Human sacrifice, although it prevails among some of the northern tribes, is not common, and is only resorted to in cases of great national calamity, when the sacrifice of dogs or reindeer proves unavailing. The Koraks and Tchucktchis have, however, a custom which is little less barbarous than human sacrifice, and that is the cold-blooded murder of all their old, infirm and sick. As soon as one of their tribe becomes unable, by reason of age, blindness or disease, to endure the fatigue and exposure of their wandering life, they put him to death, generally, by spearing him or crushing his head in with stones. Long experience has given them a terrible familiarity with the best and quickest methods of taking life, and they explained to us, with the most sickening minuteness, the different ways in which a man could be killed, and the vital parts of the body, where a spear or knife-thrust would cause most immediate death. They are all taught to look forward to such a violent death as the natural end of their existence, and meet it as composedly and stoically as man can ever meet his last enemy.

In bright and marked contrast to these gloomy superstitions and bloody rites are the laughter-provoking ceremonies of a Korak mar-

riage, which, like all their customs, bear every mark of entire originality. Every young man in the tribe of Koraks who desires to marry, is compelled to work one, two or three years for his wife. He cannot buy her for ten cents as can the Russian, and then have some one else pay the expenses of the wedding. The Korak father sets a higher price upon his daughter's hand than this, and only two or three years' work is considered a fair equivalent. At the expiration of the young man's long apprenticeship the band to which he belongs is convened in the largest tent of the encampment to witness the marriage ceremony. A feast is prepared of blubber, marrow, venison, dried fish, and other Korak delicacies, and the assembled crowd spend a short time before the ceremony in eating and talking over the anticipated event. When this is ended, one of the Koraks takes up the native drum, which is inseparable from all their ceremonies, and begins a low, musical recitative, which increases gradually in volume and energy until it swells into a wild, barbarous chant, timed by the regular beats of the heavy bass drum. A native enters with an armful of willow and alder switches, which he proceeds to distribute in all the pologs or little skin bedrooms around the inner circumference of the tent. The front curtains of all these little rooms are then thrown up; the women station themselves in detachments of two or three at the entrance of every pigeon hole, and take up the willow and alder branches which have been provided. When every thing is ready a venerable native comes out from a closed polog near the door, leading the young Korak and his dark-faced bride. Their appearance is the signal for renewed excitement. The music increases in rapidity, the natives all join in the barbarous chant, and break out, at intervals, into shrill cries of excitement. At a given signal the bride suddenly darts into the first polog and commences a rapid flight around the tent through all the little rooms, raising up the curtains between them as she passes. The bridegroom instantly follows, in hot pursuit. The women, who stand at the opening of each polog, assist the bride's flight in every possible way, but when the unfortunate bridegroom attempts to pass they trip him up, pull his hair, throw the curtains over his head, and beat him over the back with their switches until it is an unexplained mystery how he escapes with his life. If, under all these disadvantages, he does not succeed in catching the bride before she completes the circuit of the tent, he is not married and must console himself with the reflection that, after two or three more years' work he can try it again. The ceremony gener-

ally ends, however, in a happier way. The bride, at the last moment, permits her lover to catch her, and the marriage ceremony is completed. The object of this singular custom is, evidently, to give the woman an opportunity to marry the man or not, as she chooses, for, it is, of course, impossible for him to overtake her unless she permits it. It shows a greater delicacy of feeling and regard for the wishes of the weaker sex than is common in an unreconstructed state of society, but it seems to me that the same results could be obtained without so much abuse of the unfortunate bridegroom. Some regard ought to be paid to his feelings, if he is a man, and woman's rights should never include the privilege of personal chastisement. The Korak men, however, are the only persons interested, and if they feel disposed to submit to it, I suppose there is no call for outside interference. It is impossible to question the bravery of a Korak who has ever been married. The simple fact that he has gone through such an ordeal is the strongest proof of his courage. I once knew a native in Kamtschatka who had married three wives, and I felt as much respect for his heroic bravery as if he had charged with the Six Hundred at Balaklava.

We traveled with the wandering Koraks over the snowy plains of Northern Kamtschatka for nearly three weeks, riding all day behind their fleet reindeer, and sleeping every night in their smoky pologs. Never were we treated by them otherwise than kindly, and I cannot withhold my tribute of gratitude from the people with whom I so long lived, and in whose tents I have so often slept without a single companion or weapon, 200 miles beyond the Russian outposts. Barbarous and uncivilized they may be, but many nations which stand higher than they in the scale of social and religious enlightenment might learn from them a lesson of kindness and hospitality to strangers.

We arrived at the Russian settlement of Ghijiga, near the head of the Okhotsk sea, late in November, after twenty days of fatiguing travel on the reindeer sledges of the Koraks. It was the Russian Sunday, and the chiming of three or four bells, from the red dome of the little church, as we entered the village, brought up many long buried recollections of home, and was almost the first familiar sound which we had heard for five months. At Ghijigha we were at last upon the proposed route of the telegraph line between Behring's straits and the Amoor river, and our winter's work of exploration was to be commenced. Hiring a dozen natives, with their dog

sledges, to transport us and our store of provisions, we turned our faces again northward, although the polar star was already high overhead. In traveling from the Okhotsk sea toward Behring's straits, we entered upon the most barren and utterly desolate portion of all the Russian empire. Vast level plains, as boundless to the weary eye as the ocean itself, stretched away in every direction to the far horizon, without a single tree or bush to relieve their white, snowy surface. No sign of animal or vegetable life, no suggestion of summer or flowers, or warm sunshine, ever brightened this dreary waste of storm-drifted snow, over which seemed to brood the awful silence of universal death. Even the sun seemed to grow tired of trying to infuse warmth and life into the bleak, wintry landscape, and only showed its red lurid face for two hours each day above the horizon. The wavering, uncertain flashes of the aurora, however, brightened as the sunshine faded, and throughout the long dark night of twenty-two hours, flickering streamers of mysterious light waved and trembled in the northern heavens, and cast a faint, unearthly radiance over the white snow. Upon these desolate plains we experienced, for the first time, the extreme cold of the Arctic zone, our thermometer standing, for three or four successive days, at minus forty, and sinking on New Year's eve to fifty-three degrees below zero. We had often read in the travels of Kane, Hall and McClintock, of the intense cold of high northern latitudes, but we had never been able to imagine what effect such temperature would produce, not only upon the human body, but upon nature generally. We had now an opportunity of satisfying ourselves, for on New Year's eve in that temperature of fifty-three below zero, we camped out on the open steppe without even the shelter of a tent. The first sensation which you notice in going from a warm room into a temperature of fifty, is a burning pain in the throat and lungs as if you were inhaling hot steam. You do not feel particularly cold, but the air drawn into the lungs through the mouth seems hot and causes an inclination to cough. You are obliged, perhaps, to cover your face and breathe slowly through the nose, until the lungs and throat become somewhat accustomed to the temperature. If you stand quietly for five or ten minutes in the open air, frost forms on every thing which is touched by your breathe. The beard becomes a stiff tangled mass of frozen iron wire, the eyelids grow heavy with white rims of snow and freeze together when you wink, and the muscles of the face gradually stiffen until you can hardly move your lips enough to talk. It is almost as

difficult to smile or throw any expression into one's face as it would be were it covered with a close fitting iron mask. If you still stand motionless and make no effort by exercise to quicken the circulation, the intense cold begins to produce more serious effects. The nose and cheeks, with a curious pricking sensation which is barely perceptible, begin to turn white as wax, and the feet, if they are not very warmly covered, lose gradually all feeling of life. If you attempt to walk your toes seem to be gone, and you have the curious sensation of walking upon your heels, until finally your heels also go, and you hobble about apparently on your ankle-joints. Below them there is no more feeling than if the extremities were made of wood. The feet may not yet be frozen, but the circulation of blood in them has stopped, and if you do not wish to lose them entirely, it is time to bring the experiment to a close. Most travelers are satisfied with the easily procured experience of a frozen nose, and have no desire to learn by personal trial how it feels to freeze any other part of the body.

I have been surprised many times in Siberia to see how closely the extremes of heat and cold approach each other in their effects.

A level plain of snow when the thermometer stands at 50° below zero seems to shimmer and tremble in its outline just as our fields do at home under the blazing sun of August.

The warm bodies of dogs and reindeer give off dense clouds of steam, which rise six or eight feet in the air and hang motionless over the road long after the animals have passed. Even the bare hand wiped perfectly dry and exposed to such a temperature will exhale a thin cloud of vapor. The Russian explorer Vrangell states that at 64° below zero he has seen a crow's body give off steam as it passed through the air, and although I once considered that a very questionable story, I have seen reason to believe in its truth. A bar of iron chilled to the temperature of 60° below zero burns the hand when touched exactly as it would if it were red hot, and I do not think any one could tell from the feeling alone whether it were heated or frozen. In either case the sensation is that of burning and the effect is a blister. In the winter of 1866, when the thermometer once fell as low as — 68°, we tried the experiment of freezing quicksilver. After four minutes' exposure to the air, in a pair of bullet moulds, the mercury crystallized and hardened to the consistency of lead, and loading a Sharp's rifle with the frozen slug, we fired it through a pine board. In such terrible temperatures as these, camp-

ing out-doors is, of course, no trifle; but even then the danger to life is not so great as one would suppose. In the temperature which I have just mentioned, 68° below zero, a party of five men, under Lieut. Bush, spent a long night of sixteen hours on the open steppe. Of course, they suffered and were obliged to run and wrestle almost constantly to keep from freezing, but they did not lose a man or a dog, and not one of the party would have hesitated to try it another night had it been necessary. With proper clothing and plenty of fat food, I believe man can endure for several days the most intense natural cold which has ever been observed. All the cases of freezing to death which I have ever known were the result either of carelessness, physical exhaustion or lack of food. There is a very general misapprehension with regard to the danger of sleeping out-doors in low temperatures. Many people think, and I once thought myself, that to go to sleep in intense cold is to invite death. It depends entirely upon the man's condition when he lies down to sleep. He may have on no thicker clothing than a linen coat, but if he goes to sleep warm he will always wake up before he freezes, no matter how intense may be the cold. If he is thoroughly chilled through, however, in the first place and feels indisposed to make any exertion, sleep is certain death. Until I learned it in Siberia I never knew this fact, and the first night which I spent out-doors in a temperature of 30° below zero was one long struggle with my desire to sleep. I dared not close my eyes lest I should never wake, and for hours I watched the twinkling stars through the tree-tops as if my very life depended upon my wakefulness. The Siberian dress furnishes as effectual protection from cold, probably, as that of any northern people, and I believe it to be very much superior to the costume of the Esquimaux, which has generally been adopted by our Arctic expeditions. I have a specimen of the dress with me.

As we made our way slowly northward and eastward from the Okhotsk sea toward Behring's straits, we began to hear from the wandering natives strange and vague stories of a party of white men who had mysteriously appeared in a fire ship about three months before, and who had landed on the coast of the Pacific south of Behring's straits, and were there spending the winter. What could induce white men to select such a desolate, forsaken, uninhabited portion of Siberia, for a winter residence we could not imagine, and we paid at first little attention to the incredible story. As we penetrated, however, deeper and deeper into the territory of the wander-

ing tribes, the reports of this party of white men took more definite shape. They were living, the natives said, in a little underground hut, on a vast, barren steppe, nearly 300 miles from the nearest settlement. Their subterranean house had been entirely buried by the drifting snow, and nothing but a curious iron tube, through which came smoke and sparks, showed where the white men lived. This curious iron tube, which so puzzled the natives, we supposed to be a stove-pipe, and it furnished the strongest confirmation of the truth of the story. No Siberian native could have invented the idea of a stove-pipe. Some one must have seen it. Further conversation with the wandering bands of Tchucktchis whom we met, suggested the idea that this band of white men might be one of our own exploring parties, which, without our knowledge had been landed on the Siberian coast to co-operate with us. The more we thought of this, the more probable it seemed, and at last we decided to make up a party of natives and go in search of the reported exiles, who might, by this time, be suffering from starvation, or be murdered by the fierce tribes who were said to inhabit that coast. Late in January we succeeded in prevailing upon eleven natives to accompany us, and we set out for a journey of nearly 300 miles, over a vast desert of snow, with nothing except the story of a stove-pipe to guide us in our search. The party was said to be living near the mouth of a river called the Anadyr, which empties into the Pacific south of Behring's straits, and this river we followed during all the latter part of our journey.

Eleven days after, toward the close of the long twilight which succeeds an Arctic day, our little train of eleven sledges drew near the place where, from native accounts, we expected to find the long-exiled party of Americans. The night was clear, still and intensely cold, the thermometer at sunset marking forty-four degrees below zero, and sinking rapidly to fifty, as the rosy flush in the west faded and darkness settled down over the vast, silent plain. Many times before in Siberia and Kamtschatka I had seen nature in her sterner moods and winter garb, but never had the elements of cold, barrenness and desolation, seemed to combine into a picture so dreary as the one which met our eyes that night near Behring's straits. As far as eyes could pierce the gathering gloom, in every direction lay the barren steppe like a boundless ocean of snow blown into long wave-like ridges by previous storms. There was not a tree, nor a bush, nor any sign of animal or vegetable life, to show that we were not traveling on a frozen ocean. All was silence and desolation. The country

seemed abandoned by God and man, to the Arctic Spirit, whose shifting banners of auroral light flared out fitfully in the north in token of his conquest and dominion. The full moon had risen huge and red in the east throwing a lurid glare over the field of snow, but as if it too were under the control of the Arctic Spirit, it was only the mockery of a moon and was constantly assuming the most fantastic and varied shapes. Now it extended itself, laterally, into a long ellipse, then gathered itself up into the semblance of a huge red urn, lengthened out again to a long perpendicular bar with rounded ends, and finally became triangular. It can hardly be imagined what added wildness and strangeness this blood-red distorted moon gave to a scene already wild and strange. We seemed to have entered upon a frozen abandoned world, where all the ordinary laws and phenomena were suspended, where animal and vegetable life were extinct, and from which even the favor of the Creator had been withdrawn. The intense cold, the solitude, the oppressive silence and the red, gloomy moonlight, like the glare of a distant but mighty conflagration, all united to excite in the mind feelings of awe, which were, perhaps, intensified by the consciousness that never before had any human being, save a few wandering Tchucktchi, ventured in winter upon these domains of the frost king. There was none of the singing, joking and hallooing with which our drivers were wont to enliven a night journey. Stolid and unimpressible though they might be, there was something in the scene which even they felt and were silent. Hour after hour wore slowly away until midnight. We had passed by more than twenty miles, the point on the river where the party was said to be, but no sign had been found of the subterranean house or its projecting stove-pipe. Where we were now no one could tell, except that we were distant eleven days' journey from the nearest settlement and seventy-five miles from the nearest wood. The ice in the river, however, had suddenly become salt, showing that we had reached the tide-water of the Pacific and that the ocean itself could not be far away.

For twenty-four hours we had traveled, night and day, without a single stop having been unable to find wood for a fire, and the intense cold, fatigue and lack of warm food began at last to tell upon our silent but suffering men. We all felt that we had not one chance in a hundred of finding at midnight on that waste of snow the little subterranean house of which we were in search. We did not even know on which side of the river it was, and the river itself was nearly

two miles in width. Our dogs finally began to show unmistakable signs of exhaustion, and their swollen and frozen feet cracked open and left bloody tracks for miles over the steppe as we moved slowly on. The nearest wood was now seventy-five miles behind us and every thing depended upon finding shelter within two or three hours. If we did not we should certainly have to stop, and to camp without a fire in our chilled and exhausted condition was almost certain death. At last Dodd, my only American companion, laid down on his sledge to sleep, regardless of my remonstrances and paying no attention whatever to my questions.

He was evidently becoming benumbed by the deadly chill which struck through the heaviest furs, and which was constantly making insidious advances from the extremities to the seat of life. He probably would not live an hour unless he could be roused. Discouraged by his apparently hopeless condition, and exhausted by the constant struggle to keep warm, I at last decided that we would go no further. By stopping where we were and breaking up one of our sledges for firewood, and boiling some tea, I hoped that we would be able to get through the night, but to go on seemed to be needlessly risking the lives of all. I had just given the order to the sledgers near me to camp, when I thought I heard a faint halloo in the distance. All the blood in my veins rushed with a great throb to the heart as I threw back my fur hood and listened. Again a faint, long-drawn cry came back through the still frosty air from the sledges in advance. My dogs pricked up their ears and started eagerly forward, and in a moment I came upon our leading drivers gathered in a circle around an overturned whaleboat, which lay half buried in snow by the river bank. The footprint in the sand was not more suggestive to Robinson Crusoe than was this old weather-beaten whaleboat to us, and we thanked God for even this guiding sign on that vast sahara of frozen snow. Brushing away with my mitten the heavy fringe of frost which hung to my eyelids, I looked eagerly around for a house, but my dogs' instincts were quicker than my sight, and they dashed away with impatient whines toward a little mound of snow about a hundred yards distant. Out of the top of this snow-drift projected the long talked of stove-pipe, and as we drew up before it I shouted to Dodd that the Behring's Straits party was found. The unexpected discovery at midnight of this exiled party of Americans, when we had given up all hope of shelter and almost of life, was a God-send to our disheartened spirits, and I hardly know in my excitement what

I did. I remember now walking hastily back and forth and repeating softly to myself, "Thank God! Thank God!" at every step, but I was not conscious at the time of any thing except the great fact of our safety. There was no sound of life in the house, or rather in the snow bank, before us, and the inmates were evidently asleep. Seeing no sign anywhere of a door, I walked up on the drift and shouted down the stove pipe, "Halloo the house!" The hail seemed to the startled Americans to come out of the stove, and for an instant there was no reply, but presently, through the pipe, I heard a startled voice demanding "Who's there?" "Come out and see; where's the door?" The voice again replied that the door was on the south-east corner, and I started around the drift to find it. The inmates of the hut had dug a deep trench, about thirty feet in length, for a doorway, and had covered it over with reindeer skins. Stepping incautiously upon this frail roof, I fell through just as one of the Americans was coming out with a candle. My sudden appearance was not calculated to restore the steadiness of startled nerves, for I wore a heavy fur mask on my face, and only the eyes, peering out through tangled masses of frosty hair, showed that the furs encased a human being. The man took two or three frightened steps backward, but as I recognized his face and spoke to him again in English, he stopped, and tearing off my mask and fur hood, I spoke my name. Never was there such rejoicing as that which then took place in that underground hut as we recognized in the exiled party five of our old comrades and friends, to whom, eight months before, we had bid farewell as we sailed out of San Francisco bay for Kamtschatka.

Five months they had been living in that snow-covered cellar without ever seeing the face of a civilized man, and they had not dreamed that there was another American within a thousand miles of their lonely camp. Five days afterward we started back with the rescued party, and on the seventeenth day of February we returned in safety to the Russian settlement of Anadyrsk.

It is, of course, impossible, within the limits of a single lecture, to follow our little party through its two years and a half of travel and adventure. I can only touch hastily upon the most marked features of our wandering life, and those which illustrate in some way the peculiarities of the unknown country through which we traveled.

Riding all day on dog sledges and camping out at night on the snow, in all kinds of weather, made up our life, and it was lonely and dismal enough many times to have satisfied the gloomiest hermit

who ever abandoned the pleasures of the world for a residence in the wilderness. To all that class of soured, disappointed, misanthropical spirits, I can confidently recommend Siberia as a congenial retreat from the worries of life.

No wars or rumors of wars, no tailors' bills, no charitable subscriptions, no hand-organs, peddlers or lecturers, will ever disturb their peaceful meditations. They will be as safe from all intrusion as if they lived in the moon.

Long before we finished our first winter's explorations, we were compelled to resort to every imaginable means of passing away the time. Going into camp frequently as early as one o'clock in the afternoon, when the sun disappeared we had before us twenty-two hours of darkness, through which we must either sleep or amuse ourselves in some other way. Twenty-two hours sleep for any one who was not a Rip Van Winkle was rather an overdose, and for more than half that time we were obliged to sit around the camp-fire and talk. That did very well for fifty or a hundred nights, but our mental resources finally ran very low and we couldn't think of a single subject about which we knew any thing, that had not been talked over, criticised and discussed to the very bone.* Finally the happy thought occurred to me that I might pass away the long evenings by delivering a course of lectures upon scientific subjects to my native drivers. It would amuse me and at the same time instruct them, or at least I hoped it would, and I proceeded at once to put the plan into execution. I turned my attention first to astronomy. Camping out doors on the open steppe, I had every facility for the explanation of my subject, and night after night I might have been seen in the center of a group of eager natives, whose swarthy faces were lighted up by the red blaze of the camp-fire, and who watched with childish curiosity while I explained an eclipse of the moon. I was compelled, like John Phœnix, to manufacture my own orrery, and I did it with a lump of frozen tallow to represent the earth and a chunk of black bread for the moon. The resemblance to the heavenly bodies was

* We had related to each other, in detail, the whole history of our respective lives. We had discussed in full every known problem of love, war, politics, science and religion, including a great many that we didn't know any thing about, and were finally driven to such subjects as the size of Xerxes' army in Greece and the probable extent of the deluge. As there was no possibility of arriving at any definite conclusion with regard to these two questions, the debate was prolonged for twenty or thirty consecutive nights, and finally left open for future consideration. In cases of desperate emergency, when all other topics of conversation failed, we invariably returned to Xerxes' army and the flood.

not, I must confess, very striking, but by making believe very hard, we managed to get along. A spectator would have been amused could he have seen with what grave solemnity I circulated the bread and tallow in their respective orbits, and have heard the long drawn *Tyee!* of astonishment from my native audience as I brought the bread into eclipse behind the lump of tallow. At the close of my first lecture my scholars showed their entire comprehension of the nature of the heavenly bodies by melting up the earth to drink and devouring the moon whole. I endeavored to explain to them that my lectures were intended to be astronomical and not gastronomical, and that eating up the heavenly bodies in that reckless way was very improper. My remonstrances had very little effect, however, and I was obliged to provide a new sun, moon and earth for every lecture. It soon became evident that these astronomical feasts were becoming altogether too popular, for my audience thought nothing of devouring a whole solar system every night, and the resources of our bread bag were limited. I was compelled, therefore, to use stones and snowballs to represent the planets instead of bread and tallow, and from that time the popularity of my lectures steadily declined until I was left without a single hearer.

The natives generally believed implicitly every thing which the Americans told them, and I am afraid the latter sometimes imposed on their credulity by stories of wonderful steam-cars which traveled 200 miles an hour, and fabulous balloons, in which a man could go to the moon. If they did, however, the natives never knew it, but trusted faithfully in the white men's veracity. On one occasion I told my native drivers that I had seen a flying fish. Every face at once assumed an expression of disbelief, and finally their spokesman, with a rebuking glance, said: "We have always believed what you told us about the wonderful steam-cars and fire-ships, because we never saw any such things, and thought you were a true man, but now we know you lie." From this time all of my stories were listened to doubtfully, and I never could entirely regain my lost character for truthfulness. That unfortunate fish story threw discredit on every thing. Steam-cars and fire-ships they knew nothing about, and the wonderful Americans might have such things, but they had seen thousands of fish and knew that they did not fly. I might "tell that to the marines," but I could not impose it upon an intelligent Korak. We found that the name and fame of Americans had long preceded us in every part of Siberia. There was not

a man, woman or child in all that vast territory who had not heard of the *Amerikanse*, although some of them had never seen the face of a white man. American papers and magazines we discovered in more than a dozen places in the interior of Siberia and Kamtschatka, often 300 miles from the sea coast, where no foreigner had ever before been. More than this: In one native hut near Anadyrsk we found a picture of Major-General Dix, worshipped as a Russian saint. A gilded candle was burning before his stern features, and every night and morning a dozen natives said their prayers to a major-general in the United States army. It is the only instance on record, I believe, where a major-general has been raised to the dignity of a saint without even being dead. St. George of England was originally an army contractor, but he was not canonized until long after his death, when the memory of his contracts was no more. For Major-General Dix, however, was reserved the peculiar privilege of being a United States minister in Paris and a saint in Siberia. If it had been General Butler now, the mistake of the natives might have been excused on account of the saintly expression of his countenance, but I cannot imagine what there was in General Dix's features to call for worship.

Although the natives and Russian peasants everywhere had heard of Americans, we found that in some places they had associated very curious ideas with the name. In the Siberian city of Omsk, on the frontier of Chinese Tartary, I once had occasion to buy some bread in a Russian bakery. The proprietor of the establishment, as he counted out the loaves, remarked carelessly that I seemed to speak Russian with a foreign accent, and asked if he might be permitted to inquire in what part of the world it had pleased my high excellency to be born. I could not refuse to answer a question so politely worded, and replied that, as I had not enjoyed the early advantages of Siberian parentage, I had condescended to be born an American. "An American!" he exclaimed. "*Achte soodare moi svett* (hold on while I bring my wife and children)." Out he rushed and presently returned with a woman, five children and the whole force of the bakery, whom he proceeded to arrange along the wall in favorable positions for watching the wonderful American's movements. He then addressed his staring children something in this style: "There, Ivan Nekeefer, do you see him; he's an American, all the way from America, more'n a hundred miles from here; just think of it and look at him; now, if you'll only be good children perhaps you'll

all be Americans some day." I tried to assume as majestic an appearance as possible in order to impress the children with the desirability of becoming Americans at the earliest possible moment, but they didn't seem to see it. Suddenly a new thought seemed to strike the baker, and looking at me curiously, he said: "Why you're not so very black." I didn't see the pertinency of this remark at all, and replied that with the exception of a somewhat dirty face, which was accidental rather than constitutional, I didn't think I was very black. "But," said he, "I thought all the Americans were black."

This was the severest thrust I ever had from a Russian, and I gathered up my bread and left the establishment in silence. I had, several times before, been taken for a Polish exile, but never for a contraband, and I did not propose to exhibit myself to a Russian bake-shop in any such character.

We were puzzled, at first, to know how these American pictures and papers found their way to this isolated, unvisited, unknown part of Asia, and how the natives, everywhere, had become so familiar with the name of the American people. The mystery was easily explained. The American whaling fleet, whose vessels cut the waters of every sea on the globe from the eightieth parallel of north latitude to the extremity of Cape Horn, sends, every summer, a detachment of hardy sailors to the Siberian coast. They, like all citizens of our free republic, are reading men, and they carry American papers, as well as the American flag, to the ends of the earth. From these whalers the natives obtain them, and, attracted by the pictures, they circulate them from one band to another throughout the country. The publishers of Harper's Weekly, will, perhaps, be surprised to learn that their periodical is as carefully studied by the wandering natives of Siberia as it is by the more enlightened people of America, yet such is the fact.

We were amused, many times, by the comments of the natives upon the pictures in these papers. I remember that a Korak once brought to me an old tattered fashion-plate from Frank Leslie's Illustrated Newspaper, containing three or four full length figures of imaginary ladies in the widest expansion of crinoline. The poor Korak said he had often wondered what those objects could be, and now, perhaps, I could tell him. He evidently had not the remotest suspicion that they were intended to represent human beings. I finally told him that they were American women. He burst out into a *Tyee!* of amazement, and asked, with a wondering look, "Are

all the women in your country as big as that at the bottom?" It was a severe reflection upon our ladies' dress, and I did not venture to tell him that the bigness was artificial, but merely replied that they were.

He looked curiously down at my feet and then at the picture, as if he were trying to trace some resemblance between the American man and woman, but he failed to do it, and evidently concluded that they must be of widely different species.

We spent a considerable part of our first winter in Siberia at the little Russian outpost of Anadyrsk, which is situated about 400 miles west of Behring's straits, on the edge of the Arctic circle. It is a small settlement of only about 150 inhabitants, and does not possess, in itself, a single feature of interest, but with it are connected some of the pleasantest recollections of our Siberian life. It was here that we saw, for the first time, the full splendor of the aurora borealis, and that alone should make the little village forever memorable.

Among the few pleasures which reward the traveler for the hardships and dangers of life in the far north, there are none which are brighter or longer remembered than the magnificent auroral displays which occasionally illumine the darkness of the polar night, and light up, with a celestial glory, the whole blue vault of heaven. No other natural phenomenon is so grand, so mysterious, so terrible in its unearthly splendor as this. The veil which conceals from mortal eyes the glory of the eternal throne seems drawn aside, and the awed beholder is lifted out of the atmosphere of his daily life into the immediate presence of Deity. Four years ago in February, at Anadyrsk, there occurred one of the grandest displays of the Arctic aurora which had been observed there for more than fifty years, and which exhibited such unusual and extraordinary brilliancy as to frighten even the natives. It was a cold, dark, but clear, winter's night, and the sky in the earlier part of the evening showed no signs of the magnificent illumination which was already being prepared. A few streamers wavered now and then in the north, and a faint radiance like that of the rising moon shone above the dark belt of shrubbery which bordered the river, but this was not an unusual occurrence, and it excited no notice or remark.

Late in the evening, however, we happened to go for a moment out of doors, and as we stepped into the open air there burst suddenly upon our startled eyes the grandest exhibition of vivid, dazzling light and color of which the mind can conceive. The whole universe seemed to be on fire.

A broad arch of brilliant prismatic colors spanned the heavens from east to west, like a gigantic rainbow, with a long fringe of crimson and yellow streamers stretching up from its convex edge to the very zenith.

Every portion of the vast arch was momentarily wavering, trembling and changing color, and the brilliant streamers which fringed its edge swept back and forth in great curves, like the fiery sword of the angel at the gate of Eden.

At intervals of one or two seconds luminous bands parallel with the arch rose out of the northern horizon and swept with a swift, steady motion across the whole heavens, like long breakers of phosphorescent light rolling in from some limitless ocean of space.

In a moment the great auroral rainbow, with all its waving streamers, began to move slowly up toward the zenith, and a second arch of equal brilliancy formed directly under it, shooting up a long serried row of slender colored lances toward the north star, like a battalion of the celestial host presenting arms to its commanding angel.

Every instant the aurora increased in unearthly grandeur.

The luminous bands revolved swiftly like the spokes of a great wheel of light across the heavens, the streamers hurried back and forth with a quick, tremulous motion from the ends of the arches to the center, and now and then a great wave of crimson would surge up from the north and fairly deluge the whole sky with color, tinging the white snow for miles around with its rosy reflection.

But, as the words of the prophecy, "and the heavens shall be turned to blood," formed themselves upon my lips, the crimson suddenly vanished and a lightning flash of vivid orange startled us with its wide all-pervading glare, which extended even to the southern horizon as if the whole volume of the atmosphere had suddenly taken fire. I even held my breath for a moment as I listened for the tremendous crash of thunder which it seemed to me must follow this sudden burst of vivid light, but, in heaven or earth, there was not a sound to break the calm silence of midnight, save the hastily muttered prayer of the frightened native at my side, as he crossed himself and kneeled down before the visible majesty of God. I could not imagine any possible addition which even almighty power could make to the grandeur of the aurora as it now appeared.

The rapid alternations of crimson, green, yellow and blue were reflected so vividly from the white surface of the snow, that the whole world seemed now drowned in blood, and then quivering

in an atmosphere of pale ghastly green through which shone the unspeakable glories of the two mighty arches. But the end was not yet. As we watched with upturned faces the swift ebb and flow of these great celestial tides of colored light, the last seal of the glorious revelation was suddenly broken and both arches were simultaneously shattered into a thousand perpendicular parallel bars, every one of which displayed in regular order from top to bottom the seven primary colors.

From horizon to horizon there now stretched two vast curving bridges of colored bars, across which we almost expected to see passing and repassing the bright inhabitants of another world. Amid cries of astonishment and exclamations of "God have mercy," from the startled natives, these innumerable bars began suddenly to move back and forth, with a swift dancing motion, along the whole exten of both arches, passing each other from side to side with such bewildering rapidity that the eye was lost in the attempt to follow them. The whole concave of heaven seemed transformed into one great revolving kaleidoscope of shattered rainbows.

Never had I even dreamed of such an aurora as this, and I am not ashamed to confess that its magnificence, for a moment, overawed and frightened me. The whole sky, from zenith to horizon, was one molten mantling sea of color and fire — crimson and purple and scarlet and green, and colors for which there are no words in language and no ideas in the mind — things which can only be conceived while they are visible. The signs and portents in the heavens were grand enough to herald the destruction of a world, and the dead silence of an Arctic midnight only deepened the impression of their unearthly splendor.

With the separation of the two arches into bars the aurora reached its utmost magnificence, and from that time its supernatural beauty slowly but steadily faded. The first arch broke up and soon after it the second. The flashes of color appeared less and less frequently, the luminous bands ceased to revolve across the zenith and in an hour nothing was left in the dark starry heavens to remind us of the aurora, except a few faint Magellan-clouds of luminous vapor. Its appearance, however, remained and will long remain in the memory of all who saw it, and if any thing could tempt me to return to Siberia, it would be the promise of another such exhibition of the Arctic aurora.

The long winter nights, after the month of February, began to

grow perceptibly shorter and as the sun rose gradually higher and higher, we noticed the first signs of dawning summer. Winter, in most parts of north-east Siberia, begins to break up in May, and summer advances with rapid strides upon its retreating footsteps, covering, instantly, with grass and flowers, the ground which it reclaims from the melting snowdrifts of winter.

The almost uninterrupted daylight brings forward vegetation with incredible rapidity, and the snow is hardly off the ground before the delicate wax-like petals of the blueberry and star-flower, and the great snowy clusters of Labrador tea begin to whiten the mossy plains. The birches, willows and alders burst suddenly into leaf, the river banks grow green with a soft carpet of grass, and the warm still air is filled all day with the trumpet-like cries of wild swans and geese as they come in great triangular flocks from the sea and pass high overhead toward the far north. In three weeks after the disappearance of the last snow, all nature has put on the garments of midsummer and rejoices in almost perpetual sunshine. For twenty days in June it is never dark enough to see a star even at midnight. The sun rises in the north at half-past twelve in the morning, sweeps in a great circle around the heavens and sets again in the north at half-past eleven, shining constantly for twenty-three hours. This uninterrupted daylight seemed even more strange to us at first than the long darkness of winter. We could never decide to our own satisfaction when it was time to go to bed. It seemed ridiculous to make any preparations for retiring until the sun had set, and yet if we did not, it was sure to rise again before we could possibly get to sleep, and then it seemed just as preposterous to lie in bed as it did in the first place. We finally compromised the matter by putting light wooden shutters over all our windows and then by lighting candles succeeded in persuading our unbelieving senses that it was night, although the sun outside was shining with noon-day brilliancy. When we awoke, however, another difficulty presented itself. Did we go to bed to-day, or was it yesterday, and what time was it now? To-morrow, day before yesterday and the middle of next week, were all mixed up, and no man was able to swear positively that he did not go to sleep Wednesday and wake up on the previous Tuesday morning. We lost all track of the day of the week and the day of the month, and I caught myself repeatedly making two entries in my journal in the course of twenty-four hours with the mistaken impression that two days had passed. Summer in Siberia is much more distinctly marked

than is generally supposed. On the first of July one would never believe himself to be north of the forty-fifth parallel of latitude. The thermometer at noon stands as high as seventy in the shade, the trees are all in full leaf; primroses, cowslips, buttercups, valerian, larkspur and wild roses blossom everywhere on the plains and river banks; butterflies and bees occasionally make their appearance, and throughout the twenty-four hours the trill of the song-sparrow is heard from the high grassy tundras, and the chatter of swallows and martens from under the eaves. About the tenth of July the mosquito, that curse of the northern summer, rises out of the damp moss of the low plains and winds his shrill horn to apprise all animated nature of his triumphant resurrection, and his willingness to furnish musical entertainment to man and beast upon extremely reasonable terms. In three or four days, if the weather be still and warm, the air will be literally filled with clouds of mosquitos. I have never, even in the heart of a tropical swamp, seen any thing which could be compared to it. Large fires are built by the natives around their houses, and the cattle stand all day in the smoke until they are driven by hunger to seek for food. Work of any kind becomes in many places almost impossible, and I have been compelled to live for three days at a time in a small calico tent pitched on the floor in our house. Out of it we never ventured without wearing mosquito-protectors on our heads and tying our clothing down at the wrists and ankles, over heavy boots and thick gloves. Even then the mosquitos would be almost sure to find some unguarded opening, and if they did not, they swarmed about the head until it seemed to be in the center of a bee-hive. For three weeks every summer we were obliged to suspend all work in the tamarack swamps, west of Ghijiga, for no other reason than the persecution of the mosquitos. Even our native laborers could not endure it. As far north as the shores of the Arctic ocean, in latitude 70, the natives are compelled to build large fires around their houses for the protection of themselves and their cattle. With the sharp frosts, however, in the early part of August, the troublesome insects disappear as suddenly as they came, and life becomes once more endurable. Summer lasts in the southern part of Siberia, around the Okhotsk sea, until the beginning of September, but heavy frosts frequently occur as early as the sixth of August, so that no attempt is made to cultivate the soil. In fact it only thaws out to a depth of eighteen inches or two feet, and below that remains forever frozen. By the first of October leaves, flowers, birds and all the brightness

and beauty of summer are gone, and the long winter of eight months sets in with a heavy north-east storm, which covers all the earth with a white mantle of snow.

We were compelled to do all the heaviest work in the construction of our line during the winter months on account of the difficulty of getting about from place to place in the summer. The vast level plains of moss, which compose most of the country north and east, assume in July the consistency of a great wet sponge, in which the foot will sink to the knee without leaving any permanent impression upon its soft, elastic surface. The distribution of all our poles and timber for station-houses was accomplished with dog sledges in the winter. On the 1st of June, 1867, we had explored and located the whole route of the line, 2,000 miles in length; had built more than fifty station-houses, prepared 20,000 telegraph poles, cut a road sixty feet wide through seventy-five miles of dense forest, and were preparing with a fleet of five vessels and a force of 800 native laborers to push the work to early completion. We felt the greatest confidence that we could put the line in working order by the fall of 1869, and were beginning already to anticipate the showers of laurel wreaths, which would fall upon our heads when the news flashed from New York to St. Petersburg that the Russo-American line was completed. We were destined, however, to be disappointed. A little paragraph, only two lines in length, which we found in a paper brought from California by a whaling vessel, dashed all our hopes suddenly to the ground. It was the simple announcement that all work on the Russian-American telegraph line had been suspended. Our bright visions of laurel wreaths and Russian crosses vanished like the pictures of a magic lantern when the light is extinguished, and all our past toils and hardships came up again in their gloomiest colors to deepen our bitter disappointment. We had never realized how miserable and lonely our Siberian life had been until the abandonment of the line showed us its uselessness. It seems hard to give up at once the one object to which we had devoted three years of our lives, and for whose attainment we had suffered all the hardships of cold, exile and starvation, but the Atlantic cable was a success and our Siberian line, however practical its construction might be, was substantially a failure. We began at once to make preparations for our final departure. Most of our officers and men intended to return by ship to San Francisco, but we succeeded in making up a small party to go home across Asia and

Europe around the world. On the first of September we sailed from Ghijiga for the western coast of the Okhotsk sea where our long overland journey of 5,000 miles was to begin. A crowd of sorrowful natives gathered around the landing when we embarked, and their sad, gloomy faces as they bade us farewell showed how closely they had identified their own happiness with our presence and how utterly blank and eventless hereafter would be their lonely isolated lives. Never again, probably, would Americans visit their far distant land, and the brief glimpse which they had enjoyed of civilized life and its pleasures only served to throw into deeper contrast the cheerlessness of their monotonous existence. The poor fellows, however, did what they could to give us a cheerful God-speed, and an old Russian cannon which they had somewhere found spoke out faintly when we were far at sea, the last good-bye of barbarism to departing civilization.

As the high bold coast of Ghijiga darkened and finally vanished in the gathering gloom of night, and the muffled report of the natives' cannon came faintly and yet more faintly across the widening expanse of dark water, we drew a long deep breath of relief and turned our faces with glad anticipations toward the domes of Moscow and St. Petersburgh, and our far away homes.

RECEPTION

OF

DOM PEDRO D'ALCANTARA, EMPEROR OF BRAZIL; DR. AUGUSTUS PETERMANN, OF GOTHA; PROF. A. E. NORDENSKJÖLD, OF STOCKHOLM, AND DR. C. H. BERENDT, OF GUATEMALA.

CHICKERING HALL, JULY 10, 1876.

The President, Chief-Justice DALY, in the Chair:

The meeting was called to order at a quarter past 8 P. M., the attendance of Fellows being unusually large. Every seat in the hall and in the galleries was occupied, and there was a large attendance of ladies. Seated on the platform, with a large number of the officers and of the Council, were Dr. A. Petermann, of Gotha; Dr. C. H. Berendt, of Guatemala; P. Gloobhowsky and A. Goodecken, Russian Imperial Commissioners; Commander Persira Pinto, Lieutenant Grumares and Surgeon F. Telles de Menezes, of the Russian war vessel *Nichteroy;* Professor Guyot, of Princeton; Professors O. C. Marsh and W. D. Whitney, of Yale; Professor Hilgard, U. S. Coast Survey; Professor F. V. Hayden, U. S. Geographical and Geological Survey of the Territories; Professor F. W. Putnam, of the Peabody Institute; Bayard Taylor, Professor W. M. Gabb, Henry C. Murphy, Rev. Dr. Potter, Professor Felix Adler, of Cornell; Rev. Wm. Farrell, Rev. John McGlynn, Benj. S. Lossing, Cyrus W. Field, Rev. Dr. Bellows, Rev. Nicholas Bjerring, Samuel J. Ruggles, Dr. Isaac I. Hayes, Judge R. L. Larremore, Judge James C. Spencer, Professor Julius Bien, Peter Cooper, Howard Potter, Gen. James Grant Wilson, Salem H. Wales, Gen. Siegel, John W. Hammersley, Professor Cook, State Geologist of New Jersey; Dr. Schumacher, German Consul-General; Edward Bill, A. A. Low, C. E. Detmold Algernon S. Sullivan, and several others.

After calling the meeting to order, the President, Chief-Justice DALY, rose and said:

"Our meeting has been called at this unusual season of the year, because the celebration of our national centennial having brought

together persons from all parts of the globe, the opportunity is afforded to us, by assembling the Society now, of inviting the distinguished guests who have done us the honor to be present to-night. This very large attendance of the Fellows, many of whom must have come from those retreats in the country to which all escape who can do so at this heated season, is such an evidence of the interest felt in this meeting — of the desire to be present and to welcome our guests — as almost to dispense with the formality of a welcome on my part. The paper of the evening will be read by one of our distinguished visitors, Dr. Berendt. It is entitled "The Centers of Civilization in Central America and their Geographical Distribution," a subject upon which Dr. Berendt may be regarded as the highest living authority, having passed many years of his life in Guatemala and other parts of Central America, arduously engaged in philological and ethnological researches. To his labors we are indebted for the collection and preservation of numerous vocabularies, and for a large amount of valuable work in the critical investigation, classification and arrangement of the languages belonging to, or descended from, the ancient civilizations of Central America, the fruits of which will soon be made known to the world in the publication by the Smithsonian Institution of the large work upon which Dr. Berendt has been so long engaged."

Dr. Berendt was then introduced by the president, and read the following paper:

GEOGRAPHICAL DISTRIBUTION OF THE ANCIENT CENTRAL AMERICAN CIVILIZATION.

If what I am going to say bears not exactly, because it cannot well bear, the aspect of those centennial thoughts and orations that now fill every ear and engross the attention of Americans all over the country, of civilized men all over the world, it is still to a kindred subject that I invite you to follow me. I am still going to speak of the past of America, only that, taking a somewhat wider range in space and time, I intend leading you back rather more than three centuries, instead of one, and over the boundaries of our own country into those regions which now seem to be little more than the connecting link between the north and the south of this continent, but which were once the very center, or rather the only theater, of a truly American, that is to say indigenous, development and civilization; in other words, I shall speak of Central America as it was at the time of its discovery and conquest by the Spaniards.

The history and condition of those American nations which we must consider as being, at that time, in possession of a civilization of their own, is apt not only to engage the curiosity of those who chance to inhabit the same continent; it is also of high importance for the study of the natural history of man in general, not only on account of the specific peculiarity of the physical and meteorological conditions, which are in every case powerful factors in shaping man and society, but for another and still weightier reason which I have already touched upon; for, whatever may be believed with regard to an early connection between the Old World and the New, and with regard to first impulses and ideas possibly received by the former inhabitants of America from abroad, we are obliged to admit that their development, individually and as a whole, has had its course without being further influenced by foreign elements. In this point will be found a striking difference from the developments of civilization in the Old World; and ethnology, as understood to-day, that is to say, the natural history of man, the physiology and psychology of human communities, would derive valuable advantage from the study of ancient American civilization — would, if we were better acquainted with its features. But our knowledge, in this respect, is still very limited, and opinions differ widely as to the degree of civilization attained by the more highly developed nations of America. The reason for this is to be found in two facts — first, the disappearance of that ancient civilization itself, brought about by the Spanish conquest; and, secondly, the insufficiency of, and the contradictions in, the reports given by the conquerors.

This is not meant for a reproach; it is easily understood, if, in considering the history of Spanish conquest in America, we take into account the leading ideas of the time and the conditions in which the conquerors found themselves placed. The Spanish adventurers and their followers who began the work of conquest, were not bent upon scientific researches; the subjugation of the natives was their nearest aim, and the thirst for gold their only motive. Once in possession of the country, they established themselves in their *encomiendas* and made the Indians work for them in the fields and mines. And their treatment of the natives was so cruel and reckless that the conquered race soon became considerably reduced in number; nay, in some localities they were entirely extinguished in less than half a century. The reigning families among the Indians, the priests,

the men of higher attainments and greater influence, either became Spaniards, assimilating themselves to their conquerors in customs and language and thought, or they were mercilessly persecuted and destroyed. The want of laboring hands soon led to kidnapping, and slave-trading expeditions by land and water; and many peaceful and laborious tribes were either driven from their houses and fields to the woods and mountains, or captured and carried away to perish abroad. It was of no avail that, year after year, the Spanish monarchs made wise and humane laws for the protection of the Indians. The crown was not powerful enough to enforce them in these remote colonies and to stop the destruction of the conquered race. Thus the ancient civilization disappeared soon after the conquest. But not even its memory was left to the Indians; in their sciences and arts, as well as in their religious rites and notions, the Spanish missionaries saw nothing but the work of the Devil. To his vile arts they attributed even the diversity of aboriginal languages, simply because it was an obstacle to their missionary work, and they taught the Indian to shun even the recollections of the past as a snare in which the eternal fiend might catch them. Not only their idols, therefore, and the implements of their former rites, but also their painted records, were destroyed by the fanaticism of the time, and we read with painful interest the reports of the solemn burning of hundreds of precious manuscripts by the bishops of Mexico and Yucatan.

Under these circumstances, it cannot surprise us that to-day we look in vain to the Indians themselves for information about their condition more than three hundred years ago, and that our only sources are the records of the early Spanish writers, who either were themselves present at the events and incidents of the conquest, or who had their information from eye-witnesses. Of such works we possess, indeed, a considerable number, but we encounter great difficulties in handling them critically. We do not in all cases feel sure of the veracity of the writer or of his ability to form an exact judgment, particularly when we find serious contradictions and incongruities, or an evident tendency of a dogmatic or polemic character. Even the works of writers of Indian blood, treating of the early history and traditions of their nation, must fail to inspire confidence, when we consider that, being born after the conquest, they receive their information from the second or third hand, and when we find grave contradictions, relating to facts as well as to dates, not only in different authors of the same nation and period, but also in different works

of the same author. In examining carefully the interrogatories conducted by interpreters for the purpose of extracting information of a certain kind, we are led to suspect that many a word or idea was suggested to the Indian just as the interrogator had brought it with him ready-made from home. It is intelligible enough that the authors of that period, with their orthodox and half scholastic tendencies, did not care to receive the new impressions simply as they offered themselves, but rather chose interpreting them according to their own old formulas and analogies. A striking instance of this method is presented by the Spanish grammarians, who, in treating the aboriginal languages, are particularly bent upon finding similarities or concordances with the Spanish or Latin grammar, and, if they do not find them, frequently invent them. Now, differing appreciation of those early writings has led to the most contradictory opinions regarding the early history and the degree of civilization of the native races of Mexico and Central America; and there is little hope that the veil of mystery which hangs over these matters will ever be lifted with the help of those so called historical records alone.

Fortunately other means are left. It was suggested by Humboldt, half a century ago, that more light on this subject is likely to be elicited through the examination and comparison of what palpably remains of the ancient nations, than from dubious traditions, or a still more precarious speculation. And such palpable remains we have in their antiquities and in their language. It is not too much to hope that these two branches of modern ethnological science, archæology and linguistics, will furnish us the means for reading, with a positive result, those records of the early Spanish authors, and that they will help us to a better understanding of the early history of this continent.

From this point of view I have, for a number of years, made researches into the ethnology, and particularly into the native languages of those parts of Central America and South-eastern Mexico, which, by their magnificent ruins, are shown to have been the seat of the highest pre-Columbian civilization of our continent. During five expeditions, of several years' duration each, I successively have made myself at home in Yucatan, Tabasco, Peten, Chiapas, Nicaragua, and Guatemala. My principal object has been the study of the Maya language, and of the languages and dialects which, with the Maya, constitute one of the most remarkable linguistic groups of America. All these languages (with the exception of one that

belongs to the coast of the State of Vera Cruz) are comprised within the area between the meridians of Tehuantepec and Fonseca bay, a tract of land marked by those marvelous edifices for the faithful description and delineation of which we are indebted to the late John Lloyd Stephens and Mr. Catherwood. I took the same opportunity to draw into the range of my observation the other languages spoken in the same geographical districts, and to investigate the antiquities of the country. I am thus enabled to show how such linguistic and archæological studies, even when carried out on a small scale, may assist us in obtaining a basis for a sound, critical examination of those ancient, Spanish writers, which, for want of better material, we call our "sources," helping us either to confirm and prove, or to refute their assertions; and how they may give us the means to elicit new facts, and to clear up obscure points concerning the relationship or early connections between the native nations.

The group of Maya nations comprises sixteen sections or tribes, fifteen of which form, also, a geographical unit. They occupy the peninsula of Yucatan, and extend over the mainland, approaching in Soconusco the shores of the Pacific. The fact that the Mayas possessed a long coast-line, suggests the idea that they may have been a seafaring nation, and this we find confirmed by the accounts of the earliest discoverers, who met their trading canoes; we have another proof for it in the circumstance of ships being depicted on the walls of a room in the ball-house at Chichen-Itza; it has further been pointed out, by Mr. Valentini, that the sites of the more important ones among ancient edifices or ruins are near bays and inlets, which would also tend to make it probable that those who built them were used to water-communications; it might even indicate the direction in which these people had entered the country, supposing they were not indigenous.

The languages of the Maya family are more or less affiliated amongst each other, some so near that we are rather inclined to consider them as mere dialects. The others differ in about the same degree as, for example, French, Spanish and Italian; a great number of radicals are common to them; others are distinguished only by a constant permutation of certain letters; while in others again the variation is very marked. The same happens with regard to grammatical and syntactical features; in many they are identical; in others they differ more or less. As an example of identity, we have, in all these languages, two possessive pronouns, one for words beginning with a

vowel and another for words beginning with a consonant. An instance of diversity is the formation of the plural number, which takes four different forms: prefix, suffix, reduplication and circumlocution—the latter by means of an adverb signifying "many" or "some."

The Maya language proper (*Mayathan*) is spoken through the whole peninsula of Yucatan, the ancient name of which was Maya. It is the purest and, at present, the most highly developed of all the languages of the family, and is used not only by the Indians, but also by the greater part of the white and mestizo population; in the interior of Yucatan I have met with white families who did not understand one word of Spanish. The Maya language is likewise generally used in writing and in printing books of instruction and devotion.

The Chontal of Tabasco, together with the Tzental and the Zotzil of Chiapas (both showing only dialectical variations), form a group to the west of the Maya proper. The name "Chontal," is not the original name, it being a general observation that the names of tribes and languages, as they stand at present, are, in most cases, not the original ones. *Chontalli* is a Nahuatl (Mexican) word, and means "stranger"—a foreigner. It is almost synonymous with *popoluca*, a word of the same language, the signification of which is *bárbaro*, "of another nation and language," or *bozal*, which means "of rough and uncouth speech." We find both names applied to different tribes and languages in different places of Central America and Mexico, but always in the neighborhood of people of the Nahuatl tongue, who, therefore, thus denominated any people of another language. The Chontal of the Mexican State of Guerrero is supposed to be extinguished; and of the language of the Chontales in the State of Oaxaca we know nothing. But the Chontal of Honduras, called to-day Popoluca, is a language by itself, not at all affiliated to the Chontal of Tabasco, which is undoubtedly of the Maya stock. On the other hand, the Popoluca of the State of Puebla is a dialect of the Mixteco language; the Popoluca of the State of Vera Cruz, in the northern part of the Isthmus of Tehuantepec, is a dialect of the Mixe, which again belongs to an entirely different family; the so-called Papuluca of Guatemala is pure Cakchiquel, though not in the form in which it was presented to the Academy of Vienna; while the Popoluca of Salvador is not yet known. It is a grave error to consider all these

different Chontales and all the Popolucas as scattered parts of the same tribe, as has been somewhere asserted with a certain emphasis in pretended refutation of E. G. Squier, who, long before the conclusive proofs were found, had, with his admirable intuitive perception of the truth, hit the right point, here as in many other instances, by guessing. It is generally believed, though by no means certain, that the Chontal-Indians now inhabiting this part of Tabasco are the same Indians against whom Cortes, when on the exploring expedition which led to the conquest of Mexico, fought and won his first battles. The victory obtained here enabled him to enter the great town of Centla, where, half by force, half by persuasion, he succeeded in converting the natives to the Catholic religion. This part of the Gulf-coast, however, having been entirely abandoned long ago, in consequence of the inroads made by the filibusters infesting those waters, and repeopled only during the first twenty years of this century by Indians from the interior, we find among these latter Chontal-Indians no memory of the past, not even any local geographical names, which have been carefully preserved everywhere else, and are of great assistance in tracing the early migrations of the nations and the routes of the conquering Spaniards. It was by mere chance that, in the year 1869, I discovered the site of ancient Centla, buried in the thick and fever-haunted forests of the marshy coast, and unknown until then to the Indians themselves. In the course of the excavations which I caused to be made, antiquities of a curious and interesting character were laid bare. Prominent among these ruins, and presenting a peculiar feature of workmanship, are the so-called teocallis or mounds, which here are built of earth and covered at the top and on the sides with a thick layer of mortar, in imitation of stone-work. On one of these mounds I found not only the sides and the platform, but even two flights of stairs constructed of the same apparently fragile, but yet enduring material. One of the latter was perfectly well preserved. I likewise saw clay figures of animals, covered with a similar coating of mortar or plaster, thus imitating sculptured stone and retaining traces of having been painted in various colors. The reason for this singular use of cement probably is, that in the alluvial soil of this coast no stones occur within a distance of fifty miles and more from the sea-shore; stone implements, such as axes, chisels, grinding-stones, obsidian flakes, etc., which occasionally are also found, can have been introduced only by trade. The pottery and the idols made of terra-cotta show a high degree of perfection. Regarding the period down to which such earthenware was made, a broken vase,

disinterred from one of the mounds in my presence, may give a clue. Its two handles represent Spaniards, with their European features, beard, Catalonian cap and *polainas*, or gaiters.

Another language of the Maya family is the Chol or Echolchi ("language of the corn planters"), the nearest relative of the Maya proper. It was and still is spoken in some villages in the neighborhood of the ruins of Palenque, by a few old Indian families in the towns of Santo Domingo and Tenosique, and by the western branch of the Lacandones. It has been asserted by Ximenes, and repeated by Brasseur, that the Chorti, which is spoken in the neighborhood of Copan, is identical with the Chol language. This is not proved yet, but considering the similarity in the structure and ornamentation of edifices and in the sculptures found on both these ruin-districts (Palenque and Ocosingo in Chiapas the one, and Copan and Quirigua, on both sides of the boundary line between Honduras and Guatemala, the others), this fact, if once established, would be of very great importance. As bearing upon the subject, and in eventual support of the suppositions which such identity of language would suggest, I may refer to the report of the Dominican missionaries who first visited the country situated between the said districts, and generally called Acallan, Chol and Manche. These writers give us the names of a number of tribes which are also said to have spoken the Chol language, thus establishing a linguistic link between these two districts, while an archæological connection may be shown by further examination, and by edifices and ruins which recently have been discovered on two spots of a line drawn on the map between Palenque and Copan. Closely related to the Chol is the Kekchi language, still spoken in the Alta Verapaz. The so-called Cacchi or Caechi, heard in the eastern part of the same province, is merely a dialect of the Kekchi, with rather slight differences. The original name of this tribe or language is not known. Kekchi, which means "upper language," and Kakchi, which means "lower language," seem to be accidental and more modern denominations taken from the relative elevation of the districts in which they are spoken. Another member of this group is the Pokomchi, spoken in the southern part of the Verapaz; and nearly allied to it, is the Pokoman language, still found in several localities in the south of Guatemala.

In the western part of Verapaz, and still further to the south-west, we find the Kiche group, one of the most important of the Maya family. It comprises the three so-called "metropolitan languages"

of Guatemala: Kiche, Cakchiquel and Tzutuhil, and the Ixil, nearly affiliated to Kiche proper. Cakchiquel is the name of the tribe on whose soil the Spaniards first established themselves, and the language of the same name is still extensively spoken in the vicinity and to the west of the capital. A mere dialect of it is the Tzutuhil or Achi, on the shores of the Lake of Atitan.

Between this Kiche group of Guatemala and the Tzental group of Mexico, we find, on both sides of the boundary line between the two republics, three languages, of which I have been able, so far, to examine only one, the Chaneabal, in the district of Comitan, in Chiapas (Mexico). It undoubtedly belongs to the Maya family, but is distinguished by copious admixtures from other languages of the neighboring countries. This is, indeed, indicated already by the name, *Chaneabal*, meaning "four languages." On the Guatemala side of the boundary line are the Mames, said to have formerly extended over the greater part of Soconusco, and another tribe of the name of Pokomanes. These latter are called *Chujes* by the people of Chiapas, probably on account of the calabashes which, on their visits to the Chiapas fairs, they take along, having to pass through the wide and waterless slopes of the Cuchumatan mountains. It remains to be seen whether they speak the same language as the tribe of the same name mentioned above, or if they have an independent language.

All these languages of the Maya family belong to the same geographical division. But far away, at the northern end of the Mexican State of Vera Cruz, ascending the Panuco river to its head-waters, and extending into the State of San Luis Potosi, we have another tribe, not yet spoken of, the Huaxtecas, or, as early authors call them, Cuextecas. It was proved long ago that, linguistically, they are of the same stock as the people of the Maya family, and my own investigations have convinced me that, of the different languages of this family examined by myself, they are nearest related to the Tzental. Their tradition, however, although pointing to their arrival by sea, gives no clue to an historical connection; it may be left to comparative archæology to throw light on this highly important but still very obscure question.

With these Huaxtecas we close our review of the Maya nations. We have seen how the linguistic part of the ethnological study of this group, though unfinished yet, and only a weak beginning of what may be done in the future, has helped already to determine the extent and limits, the membership, of the family, and to establish

within it groups according to the degree of relationship. It will assist us also in finding a clue to the relative age of the several groups, and to the nature of their relationship, whether descendant or collateral; not to mention the possible gains for comparative linguistics in general and American linguistics in particular.

Far away from the seats of the Mayas, at the other extremity of Central America, are the faint traces of another civilization, which, however, was already near its extinction when the Spaniards first took possession of the famous *Castilla del Oro;* it belonged to the Coiba or Cueva nation, whose wealth and refined habits had attracted the attention of the conquerors since the fourth voyage of Columbus. The early writers describe them as prominent in general culture and certain technical arts. Though broken up at that time into a great number of smaller communities, they were still united by the same language, whose domain stretched from the Gulf of Urraba across the continent to the shores of the Pacific, and along the Atlantic coast as far as the Gulf of Aburema, afterwards called Chiriqui. A comparison of the fragments of this language, preserved in the relations of the first explorers of the country, with the idioms spoken to-day by the numerous tribes scattered along the coast and the navigable rivers, has shown the latter to be the descendants of the Coiba nation. They are relapsed into a state of relative barbarity, but there is evidence and proof of their former state of high civilization, not only in the early reports, but also in the frequent occurrence among them of specimens of an exquisite workmanship in stone and gold. The art which they possessed of working the precious metal in two different ways, the one by soldering gold wires drawn out into the finest threads upon thin hammered plates of the same metal (the plate giving the general shape and outline, the wire adding bulk, shade and design), the other by founding and casting hollow figures, excites the astonishment of the most skilled jewelers of to-day. These gold figures have been found, in great number and variety, in the so-called guacas of Chiriqui and its neighborhood. We are still in the dark with regard to the connection which may once have existed between the Coibas and their neighbors, the Nicaraguan nations to the north, the Chibchas to the south. Their objects of art would seem to point both ways. Perhaps the archæological and linguistic investigations actually going on in the valley of the Cauca and at the head waters of the Magdalena, may throw some more light on the subject than has been, so far, afforded by recent corresponding researches in Costa Rica and Nicaragua.

It is in this latter country, midway between the Coiba and the Maya districts, that we have to place the third center of civilization — the Chorotegas, who, at the time of the conquest, occupied three separate sections of the shores of the Pacific Ocean. It has been asserted by the early writers that this nation was closely related to one of the more prominent tribes of the Mexican State of Chiapas, the very tribe, in fact, from which that State derives its name, though slightly corrupted; the Chapanecos, thus called after their holy bird, the red macaw, which, in their language, is called *chapa*. The connection between the Chapanecos and the Chorotegas is differently accounted for, according to a mere assertion by Remesal, the Chapanecos had come from Nicaragua, while Torquemada tells us, rather in detail, of a migration in the opposite direction. From the comparison of the somewhat obscure traditions, preserved principally by Oviedo, Torquemada and Herrera, it seems to result that the people in question first inhabited the ancient city of Cholula, on the famous table-lands of Mexico, called Anahuac, and that from this city they were named Cholutecas, or, with a corruption, Chorotegas; that afterwards, being pressed by their neighbors, they emigrated to the southeast and settled in the deserts between Tehuantepec and Soconusco, and that there a division took place, in consequence of which one section occupied the coast of Soconusco, the other advancing toward the mountains. This latter part succeeded in extending their dominion over the interior, and were found there by the invading Spaniards, under the name of Chapanecos; while those who had established themselves in Soconusco, attacked by their old enemies, migrated still further to the south, and finally settled on the strip of land between the Nicaraguan lakes and the Pacific, occupying the coast from Fonseca Bay to Nicoya. But even here they were not destined to remain unmolested. Another invasion by a tribe of the Nahuatl stock took place, and this time the invaders, wedging themselves right into their midst, got possession, and that permanently, of what is now the department of Rivas, in Nicaragua, from which they likewise peopled the islands in the great lake. Thus the Spaniards, on entering the present State of Nicaragua from Nicoya Bay, and then marching through the country, came into contact first with the southern section of the Chorotegas, or Mangues, as they were also called; then, with a Nahuatl tribe, whose capital and king are mentioned as bearing the name of Nicarao, and after these again with Chorotegas or Mangues, who, however, did not occupy the whole

tract of land up to the Bay of Fonseca, but were again separated from the Chorotegas on the shores of that bay by another foreign tribe, called Maribios. Thus we obtain the three sections into which the Chorotegas of Nicaragua were divided at the time of the conquest. Now, their language seemed to me an object worthy of having some special attention bestowed upon it — not so much for its own sake, but in order that a better understanding might be arrived at of the ethnological features of Nicaragua, which, on account of an insufficient acquaintance with its actual condition as well as with the early writers, and of the rather precarious speculations and conjectures of modern authors based upon such scanty knowledge, have become greatly confused. Having studied the Chapanecan language on a former expedition, and wishing to compare it with the Chorotegan, I visited Nicaragua in the year 1874. I found that the Indian population near the Nicoya and the Fonseca bays had entirely disappeared, and in both districts only met with some local names belonging to the Chorotegan language. In the third district, also, where descendants of the old stock are still living in twelve villages around the lakes of Masaya and Apoyo, I was informed that no other vestiges of the old idiom were left, the inhabitants speaking exclusively the Spanish language. I had, however, the good luck to ferret out some old people who still remembered words and phrases they had heard in their childhood; and I was enabled to collect material sufficient to convince myself and others of the identity of this Mangue or Chorotegan idiom with the Chapanecan language in Mexico. I was not a moment too early in obtaining this information, for the greater number of my informants died while I was staying in the country. I still hope that, with the knowledge of the Chorotegan thus gained in Nicaragua and Chiapas, it may be possible to trace their history and descent backwards to one of the nations that were living in Anahuac in the earliest times of which our records speak. This is a point where archæology must step in. Large collections of antiquities, made lately in Nicaragua for the Berlin museum by myself, and for the Smithsonian Institute by Dr. Flint and Mr. Bransford, together with those already made or yet to be made in the present abodes of the Chapanecos and in the successive dwelling places of one other Mexican nation, whose primitive connection with the Chorotegas we might be led to surmise, may bring us to important conclusions. Two other points I will mention in this connection as being of great archæological interest — I mean the reported halting places of the

Chorotegas on their way from Soconusco to Nicaragua. Considering the character of Mexican migrations in general, it seems probable that the duration of each halt stretched over at least one generation, which, therefore, was sure to leave its traces behind. And it is a well known fact, that near both places antiquities are found essentially differing from those belonging either to the neighboring nations in the north (Cakchiquels and Kiches), or to the Nahuatl tribes, which, as they extended along the coast at the time of the conquest, so now exist in a large number of villages in Soconusco, Guatemala and Salvador. Prominent among these relics of the past are numerous sculptured slabs and stoneheads which were first discovered some fifteen years ago, among the debris of ruined edifices in the department of Escuintla, and, after a long oblivion, have now been disinterred again and secured for the Berlin museum by Professor Bastian. I hope to find still others of these documents of a remote but interesting period of American history in the course of an exploration which I intend making soon in the Guatemalan coast-region, though more for the sake of completing the linguistic researches with which I am principally concerned.

Thus linguistic science has begun to invade the field of American ethnology; I have only to ask that what it can do there may not be measured by the shortcomings of my labors, commenced and carried on as they were in almost entire isolation. And let it not be forgotten that this science is as little bound as it is qualified to perform the whole task alone; archæology must lend a helping hand. But archæology is, on American soil, in its infancy as yet. Before any definite results can be obtained, the materials for archæological research have to be brought together and made accessible and available. We must have museums, in which the plastic remains of the ancient American civilizations, either original or in faithful imitations, shall, in as large numbers as possible, be collected and duly grouped and labeled according to the place and circumstances of their discovery.

You build palaces for the reception of whatever bears upon the natural history of plants and animals; is it too much to solicit an equal share of the same praiseworthy zeal for the investigation of the natural history of Man, of Early Man in America? And it is the more urgently asked for, it is the more necessary, as the elements, and ignorance, and the progress of civilization itself, tend daily more to destroy what little is left of the past of our continent.

So let me conclude with a wish and a hope that, with this second century of our country, may begin the first of a rational and fruitful progress in this particular, as in many another branch of scientific development.

[During the reading of Dr. Berendt's paper, Dom Pedro, the Emperor of Brazil, entered with the empress, accompanied by Donna Josephina da Fontseca, Maid of Honor, Donna Emilia de Carvalho Borges, wife of the Brazilian Minister, and the emperor's suite; M. Carvalho Borges, the Brazilian Minister, Chamberlain Visconde da Bon Retiro, Admiral Lamare, Dr. Sonza Fontes, and the emperor's secretary, A. T. De Macedo. Upon the invitation of the president, the emperor and suite took a seat upon the platform.]

After the reading of Dr. Berendt's paper, the president said —

We had anticipated the pleasure to-night of meeting Dr. Nordenskjöld, the distinguished Swedish arctic explorer, who has added to his previous explorations and scientific labors by his recent exploration of the River Yenissei, enriching geographical science by his very interesting and important account of the countries through which this river flows in its course to the Arctic. It was the intention of Dr. Nordenskjöld to have been present at our meeting, but he was compelled to leave two days ago for Europe, that he might be in time for the starting of the new expedition to the Arctic, planned by him, and of which he is to take charge.

The president then read the following letter from Dr. Nordenskjöld —

Letter of Prof. Nordenskjöld.

Dear Sir. — * * * I am very sorry not to be able to be present at the meeting of the American Geographical Society on Tuesday, the tenth, which would not only be a special honor to me, but would have given me an opportunity to make acquaintance with the leading geographical men of America. But I am compelled to start for Europe by the next steamer, that I may be able to meet in due time my steamer, "The Ymer," with which it is my design to go this autumn to the Yenissei and the Obi. This new expedition, which is at the expense of Oscar Dickson and Alexander Sibinakoff, has for its object to develop still further the researches and discoveries of the last year in respect to the navigability of the large Siberian rivers.

Very respectfully yours.

A. E. NORDENSKJÖLD.

Although, said the president, we are not to have the satisfaction of meeting Dr. Nordenskjöld, we have the pleasure of having with us our honorary member, Dr. Petermann, than whom no one not an actual explorer has been more fully identified with the progress of geographical science for the last quarter of a century. Apart from his valuable labors as a cartographer, the world has been chiefly indebted to him for the publication and intelligent exposition of what is going on from time to time in the great field of geographical discovery. To him the scientific travelers and explorers in every part of the world have been indebted for an early account and due appreciation of their labors, and I avail myself of this occasion to make my own especial acknowledgment of the aid I have derived from his publications, in being enabled at the close of each year to lay before the Society a summary account of the geographical work of the world. But the pleasant duty of welcoming and doing honor to Dr. Petermann, I feel will be more fitly discharged by a distinguished member of this Society, eminent not only as an extensive traveler, but as one of the chief ornaments of American literature — Mr. Bayard Taylor [loud applause] — whom I shall ask to unite with me in giving expression to the gratification of the Society at meeting Dr. Petermann.

Mr. Taylor then rose and spoke as follows:

Bayard Taylor's Remarks.

Mr. President, Ladies and Gentlemen, I have been requested, as a member of this Society, to assume the office of welcoming here to-night Dr. August Petermann, the distinguished German geographer. I accept the duty with the greater satisfaction, because I have visited Dr. Petermann at the scene of his labors from time to time during the last twenty years. I know the character and importance of this work; and the simple description of it obviates the necessity of any special eulogium. In geographical science Dr. Petermann is the worthy successor of Alexander von Humboldt and Karl Ritter, although he has made no explorations and published no narratives of travel. But he has done what was scarcely possible in their day: he has developed a new branch of activity in this great field of knowledge. I might appropriately call it the organization of discovery. From the moment when he was called to assist Perthes, the famous geographical publisher, at Gotha, he has watched every possible inroad of civilized man into the unexplored territory of the

globe. He has come to the aid of every chance unprepared traveler — drawn his charts for him, solved his guesses and corrected his rude calculations. He has guided the selected explorer, equipped him in advance, pointed out the path of achievement, and taught him how to secure the best scientific results of his daring. Seated in his office in Gotha, he has organized the conquest of Africa, of Central Asia, and the Arctic regions, cheering one hero on the same path where another fell before him. In this age of great explorations, the advantages of that central bureau of exact knowledge which Dr. Petermann has created, need no explanation from me. But inasmuch as I have personally seen so much of the duration, the extent, and the self-sacrificing character of his labors, I am glad to express, as an old friend, my heartiest concurrence in the welcome and recognition which he receives here to-night.

Let me venture to say a few words more, and pardon me if I seem to stray a little beyond the scope of this evening's meeting. Since the time of Herodotus geography and literature have always had an intimate relation. The clear narrative style and power of description which are indispensable to the traveler belong to literary art; the domains of the two continually overlap; and if I confound them now it is because I wish to speak both as a member of the Geographical Society and as a humble member of the guild of authors. The other distinguished guest of this evening, who is so soon to leave us, claims our acknowledgment not only because he has favored the explorations of Herndon, Gibbon and Orton, and assisted the scientific labors of Agassiz, Hartt, and others, but also because he has followed, with the interest of that lofty nature which is affected by all that affects humanity, the literary development of our country. With an industry that puts our national energy to shame, and a habit of almost more than republican simplicity, he has studied our geography, our industry and our institutions; but he has also found time to make the personal acquaintance, as he already knew the works, of our poets, Bryant, Longfellow, Whittier and Lowell. Such a hearty and intelligent sympathy with the highest interests of our national life demands an equally cordial recognition. I am sure that no distinguished stranger ever came among us, who, at the end of three months, seemed so little of a stranger and so much of a friend to the whole American people, as Dom Pedro II of Brazil. We can give him no better God-speed, now as he leaves our shores, than the

lines which our psalmist, Whittier, addressed to him after the decree abolishing slavery in his empire:

And thou, great-hearted ruler, through whose mouth
The word of God is said
Once more, "Let there be Light!"—Son of the South,
Lift up thy honored head!
Wear unshamed a crown by thy desert
More than by birth thy own.
Careless of watch and ward, thou art begirt
By grateful hearts alone.
The moated wall and battle-ship may fail,
But safe shall justice prove:
Stronger than greaves of brass or iron mail
The panoply of love!

At the conclusion of Mr. Taylor's remarks, the president introduced Dr. Petermann, who was received with loud applause.

DR. PETERMANN'S REMARKS.

When I had the honor of being invited to this meeting, it was suggested to me by your president, if not to read a paper, to give some remarks containing the impressions of my visits to this country. Most willing as I do feel to respond to this suggestion on the one hand, I am most reluctant to do so on the other, for I have been in this country too short a time to make any other but very hasty observations — little more than three weeks, half of which time has been devoted to the Centennial — and the impressions of what I have seen in this short time have been so overwhelming that I have not had time, as yet, to collect, as it were, my thoughts about them.

Only this very day, having proceeded from Boston to Albany, I intended going on to Niagara, as I have to return to Europe next Saturday; but in order to follow the kind invitation to attend this meeting, I stopped at Albany to come down the Hudson, on purpose to be here this evening; and being here now, I offer what I request you to take as the very superficial remarks of a tourist who not only felt the overwhelming nature of what he saw, but also the depressing influence of continued hot weather, such as I never experienced before for any length of time.

Ladies and gentlemen, I am altogether most happy that I have lived to see this great country and people. From printed descriptions and personal communications, I had imagined I knew something of America and Americans, but on coming here I have found that I knew very little, and that one gets best at the full truth when one comes to see and judge for one's self.

I knew this to be a great country and a great people, but all my expectations have been surpassed and agreeably exceeded.

In Europe, one is apt to think that many matters in this country are as yet only half finished. It may be true that this is a very young country, that its occupation and settlement have not long since only been commenced, that this very big country requires, perhaps, hundreds of millions of people more before it can be said to be fairly inhabited, somewhat after the fashion of European countries. Even on the line of your largest cities — from Washington to Boston — only the northern half of it gave me the impression of being fairly occupied, in the European sense.

But just for this very reason, all I have seen on this line has filled me with admiration and struck me as being at the head of any human progress and culture that may be found anywhere else on the globe. Among European countries, I know England pretty well, but on coming here I find many things to approve and to admire that I never saw even in London.

Of course the old countries have many things handed down to them from generations past which they cannot easily or quickly get rid of, even if they would — for example, the narrow, crooked, unwholesome streets of their towns. Cities with great means like Paris, Vienna and others, have done much to take down old streets and build up wider ones; still, in general, they must keep what they got. America has had the advantage of building up every thing anew, and it has done this, generally, in an enlightened spirit.

Even a very small tour like mine is sufficient to convince that this is by nature a highly favored and rich country. What has made Europe, the smallest of the quarters of the globe, the most important — a favored climate and an indented coast-line — is also found in this country. This Atlantic coast I have visited ranges with Italy, Greece, France, Germany, England as to the climate. In Boston greeted my eyes in great perfection fruits and products that I am accustomed to see in Germany, while I missed them further south. But so extensive is this country that from Maine to Florida and from Washington to Mexico almost all different climes congenial to civilized man are found.

The natural configuration of your Atlantic shore reminds one of the indentations of the most blessed lands of antiquity and modern time; everywhere the sea and its deep creeks and tide-rivers stretch far into the land and make communication with the rest of the world

easy. Thus, for example, the Chesapeake bay and the Patapsco, the Potomac, the Delaware bay and river, the New York bay, the Hudson river, the Long Island sound, the Massachusetts bay, and others, are the natural and favored highways to your great cities of Washington, Baltimore, Philadelphia, New York, Boston.

Only such cities that have a similar good position by sea and by land as these will be the cities of the future. I was much impressed by this great feature of your country, by visiting these cities thus favored by their natural position.

But favored as the sites are on which these cities stand, it is much more wonderful what has been done by human energy and perseverance in building them up within the short time of about 100 years—the progress from the very first settlement, another 100 years back, having been but slow. I expected to find many houses such as first settlers erect them, but I found magnificent cities, with fine palaces, elaborate structures, great public buildings, and nice comfortable family houses, all of them built either of the finest and most costly materials — marble and granite — or of a variety of sandstone and bricks, which latter, for fine quality, as in Baltimore, are unsurpassed elsewhere.

In that magnificent marble building, the City Hall of Baltimore, in the library, an interesting drawing was shown me of what Baltimore was a little more than 100 years ago — a number of small farm-houses such as might yet be seen in the country. Now, after sailing up the far-stretching Chesapeake bay, with its flat lonely shores that scarcely betray human habitations, it is most striking all at once to find one's self before an immense city, with all the features of rapid American progress, and certainly one of the great centers of commerce and industry.

I inspected some of the schools of Baltimore, and was exceedingly gratified to find in what enlightened spirit the education of this country is conducted and administered, and what large means are devoted to it. When I consider that what took me a half a day to go over were only two out of about 150,000 schools you have, it strikes me that education in this country rests on a most extensive basis, ranking with any other in the world.

The foundation of John Hopkins' University, where one single private individual devoted the sum of three and a-half millions of dollars, and the Peabody Institute, are sufficient proofs that all the higher interests of life are well taken care of in this country, as is further shown in the history of many similar magnificent donations by others of your wealthy citizens.

A most pleasing impression I had by the acquaintance with Druid Hill park, the natural and artificial beauties of which can vie with those of any city-park in Europe. In all your cities I have found these fine parks, as well as reservoirs occupying the highest elevations of the ground, supplying your cities with an abundance of fresh water. Both are highly commendable features in the life of a nation; parks and squares elevating and refreshing the mind, fresh water being the chief requirement for family and household purity and cleanliness — and cleanliness is next to godliness.

The kind and honoring reception I had in Baltimore, when I thought of landing entirely unknown, showed me how, even in that city of commerce and industry, the literature and scientific endeavors of Europe are well known and appreciated.

Washington, away from the noisy hum of a great port and center of commerce, seemed to me well adapted as the seat of the political capital and government of this country. It is built on a most magnificent plan, and the width of its streets, the extent of its squares and parks, surpass those of any other city in the world.

Here in Washington the best opportunities were in a most obliging manner accorded me in inspecting the various public departments, of which those connected with the geography and cartography of the country engaged my especial interest.

From my geographical pursuits I had long known the excellence and merit of the labors of the United States, both public and private, in this field, all over the world, in North and South America, in Africa and Asia, in the Atlantic and Pacific, in the Arctic and Antarctic regions. More and more of late years the great surveying operations of the far West have prominently and permanently engaged the attention of the whole scientific world. In Washington I had the gratification of making the personal acquaintance of a great number of these famous explorers and surveyors, the Haydens, Powells, Wheelers and others, with their effective staffs of excellent hard-working men of science, and I saw more than is possible in Europe of the vast results of their great and persevering labors, for only a small portion of these can be published; the splendid and extensive collections in all branches of natural history, as well as the vast collections of excellent photographs, must be seen to be appreciated. They are at present partly in the government building of the Centennial at Philadelphia, and afford great interest and instruction, which will increase at future times, when much of it may have become relics of times and things gone by.

It was just in the exciting time of the appropriations of Congress, that I stayed at Washington — appropriations on which also depended the extent of labor in these departments for the ensuing year. With regret I had to observe that this important part of the public service of the United States is from year to year in danger of being stinted or cut off by these yearly appropriations of Congress, and if I can find fault with any thing I have seen in the country, it is this. For the requirements of science mere politicians cannot be expected to have much feeling and sympathy, but every civilized country requires a proper survey of its territories for a multitude of purposes, and members of Congress wanting to stint or cut off the small means required for this service simply would degrade the character of this great country, and injure and retard its progress. All the surveys and explorations made hitherto by the government of this country have cost but very little time and money as compared with those of European countries.

While at Washington I had the honor to be invited to Annapolis to see the Naval Academy, and the proceedings of the festive day when the diplomas were handed to the cadets — a most delightful and instructive day. When I learned there that only one man-of-war is in service now, it struck me how essentially a country of peace this mighty country is.

Philadelphia is a wonderful instance of the marvelous growth of this country. That it is the largest city as to area in the United States, made itself felt to the visitors of the Centennial who had to go from the city to the exposition or *vice versa*, because the mere time for this by the street-cars took one hour, and sometimes, when the traffic was very dense, two hours.

The Centennial is a grand achievement, eclipsing all former expositions of that kind in Europe. Here can be clearly seen what position the United States holds in the culture of the world, in manufactures and industry, especially in machinery, as well as in science and art. Even in art, where in the opinion of many it had been considered that this country could not have had time enough to achieve as much as to rank with famous art countries of Europe, it was clearly shown that this country had made of late immense progress.

I congratulated myself with having landed at Baltimore, and thus proceeding step by step to the commercial metropolis of this country, New York. This city, and especially its Broadway, appears to me a kind of prime meridian, where two worlds meet, the Eastern and the

Western. Spending the only evening I have been in this city as yet in the lovely walks and resting places of the Battery, my mind was filled with reveries of the future, and as to what New York might be a hundred years hence.

After a day in New York, I went on to Boston by that famous Fall River line, with its wondrous steamers, a dream of fairy-land, and enjoyed the magnificent scenery through East river and Long Island sound; the like I have not seen in Europe.

When the country between Washington and New York appeared to me more like a park, perhaps awaiting still the hand of man for a greater density of population, the country from New York to Boston looks like a beautiful garden dotted all over with comfortable farm-houses and neat cottages, and a land highly cultivated and densely inhabited.

Boston struck me in more than one way as the link between the old and new country, between Europe and America — a point less hot and southern-like, the natural products and fruits reminding me more of Europe than the more southern cities. I was highly pleased with Boston, its fine streets, its Central Park, Boston Common, its bay and harbors. In rambling through the city, I visited Bunker Hill monument, Dorchester heights, and other points, and chanced to come to the north ferry that connects the city with the outlying parish of Chelsea; an eminence there attracted my attention, and thither I bent my steps, thus gaining the summit of the Chelsea highlands. Here I enjoyed the grandest view I have as yet had in the United States.

It is not so obstructed as the one from Dorchester heights, and more comprehensive and pleasing than from Bunker's Hill monument. It is a kind of small Rigi, because there is an imposing, almost boundless panorama all round — a panorama which impressed me much, as it seemed to me typical of the country, its natural resources and its immense progress. Far away to the east, in a great semicircular line, stretches the Bay of Boston, Massachusetts bay, not in a smooth, monotonous line, but picturesquely broken by a most variegated outline and a great number of islands large and small, rocks, capes, straits and river lines, till no more detail is discernible to the naked eye far away in the Atlantic ocean. Islands and shore are more or less covered with houses and culture, trees and pasture; the sea, with large and small vessels, steamboats and steam ferries; broad sea-arms are bridged over by long bridges, on which may be seen railway trains or street-cars. The main coast-line and

the heart of Boston itself are again cut up in a most picturesque way by bays, harbors, creeks and rivers that reach inland as far as the city extends. Beyond the city, in the south, rises the Blue hills and other small ranges, heightening the effect of the magnificent picture. As in the east the sea, so in the west the city, with its spires and steeples, and domes, and monuments, and smoking chimneys, extends as far as the eye can reach, until the horizon is formed by wooded eminences, as in the south. The foreground, also, towards the city, is most beautiful, because formed of undulating ground covered with charming villas and churches, interspersed with trees. To the north, on the opposite side of the city, first comes a valley, through which a meandric creek, the Snake river, runs, with its meadows and nice country houses; beyond this valley stretch long elevations with fine villas and trees; beyond that again higher ranges, wooded, and far to the north-east a nook of the sea, the shores and slopes of which are densely dotted over by the houses of Lynn.

I thought of the fine view over Venice from the Campanile, with its alternate parts of houses and sea-arms and canals; but these sea-arms are the shallow and muddy lagoons — the sea-arms of Boston the clear Atlantic ocean. The town-parts of Venice are compact streets, artificially jammed house-masses — the parts of Boston between its varied sea-arms are properly spread out, interspersed by many trees, squares, parks and green lawns. In Venice the Lido forms a long monotonous straight line, dividing the sea from the lagoons; here a much more variegated picture of sea, land and city, extends all around, as far as the eye can reach.

If any one wants the sea, islands and capes without end, he has it here; if any one wants a big, imposing, long-stretching city and houses, with clumps of trees and country scenery without end, he has it here also. As far as the city and its outlying and neighboring parishes extend, the sea, with its arms and creeks, and tide-rivers also extend. And all this may be viewed with comfort and ease, for on the summit of the Chelsea highlands stands a good hotel, with elegantly furnished rooms.

To-day I enjoyed the charming and even imposing scenery of the Hudson from Albany to New York, which ranks with the best of river sceneries of Europe.

In every respect my very limited tour in this country has been one of gratification to me. I have found a land of wonderful natural capabilities, and this land wonderfully raised and cultivated by its

people. I find many matters in advance of Europe, and every indication that progress will be gone on with as before. And every thing I see here has the appearance of its being made for the peace and happiness of the people, and this not only for the original founders of the colony, but for every race of the earth that chooses to come here. As well as English descendants, I see here from the east representatives of all the races of Europe; from the west, the yellow races of Eastern Asia, and, above all, in a strong proportion, the sons of the black continent.

To see and observe these black descendants in the position they occupy in this country has been to me a source of great interest and gratification. Hitherto I have been acquainted with the black races of Africa chiefly by the exploring expeditions, which all show those races more or less as occupying the lowest scale of human existence, constituting, as they do everywhere in their native land, an object of merchandise, the children being sold into slavery by their own father, the sisters by their brother, and so forth. Here in this country, and through this country, the Africans have been elevated from the position they occupy in their own land to that of a Christian, a working and industrious race, and are free members of the community, speaking the English idiom, no more a curse to themselves, but taking a useful rank among the rest of the world.

There are about 8,000,000 of families and 8,000,000 of houses in this country, so that about every family, of whatever race, occupies a house by itself to live in.

Some countries of the world are overstocked with people, others the reverse; to the former belongs China, which could miss 100,000,000 of its 400,000,000 without so much as noticing it. Africa, again, is a great continent, full of useful and important natural products to the world, of which little, however, can be raised, for want of labor and the slavery of its black race. There are some who, like my friend Francis Galton, in London, say: Go and take the Chinese away from China, and bring them to Africa to make that continent do better. No one, however, has as yet seriously entertained this proposal, or given it realization in any practical or extensive manner. For some time past a tide has commenced to set also from China into this country, where there is room for yet so many millions. Why should the yellow race not occupy at least the same satisfactory position to themselves and the white race as the black race does?

This remains a question to solve in the second one hundred years of the Union; and I wish you and this country sincerely the same progress and prosperity as has marked the first one hundred years in such a wonderful degree, that even such great problems as the change and remodeling of the nature and character of the African race have been satisfactorily solved.

To myself this short visit has been a source of much instruction and gratification; everywhere I have only experienced kindness, and having had the honor to be invited to this meeting, it gives me sincere pleasure to express my gratitude publicly for all the kindness I have experienced.

[The president then read a very interesting letter from the Rev. Dr. Adams, upon the occasion of the meeting, and regretting his inability to be present to welcome Dom Pedro d'Alcantara and the other distinguished guests, which is not inserted, having unfortunately been lost.]

After the reading of Dr. Adams' letter, Chief Justice Daly said:

I am sure that I express the general gratification of the whole Society, at the pleasure we receive from the presence among us to-night of Dom Pedro d'Alcantara. (Loud and long continued cheering.) Though he is with us as Dom Pedro d'Alcantara, I would like, if I may take that liberty in his presence, to say a word about the Emperor of Brazil. The instances have been very few in the world's history, in which the permanent head of a great nation has united with the qualities of a ruler, the distinction of literary and scientific attainments. Many have been patrons of learning and of science; but it is something more to be, like our distinguished guest, also an investigator and a man of learning. Indeed, I can recall at this moment but one similar instance, that of Alonzo X. of Spain, surnamed "the astronomer," and "the wise;" whose astronomical tablets, or at least those which bear his name, and which were so long in use, were said to have conferred upon him more distinction than all his battles, for he was also a warrior, and had a very troubled reign, which did not, however, prevent him from engaging largely in scientific researches. Indeed, some malicious wit of that day said that his spirit of research was so great that if he had been consulted at the creation, he would have suggested something different. Little room would be found for the indulgence of such witticisms at the present time, when the effect of all scientific investigation is to awaken a reverential spirit in contemplation of the marvelous works of creation, which, as they are gradually unfolded by scientific discovery, but aug-

ment our wonder, and make the region of the still Unknown seem to us greater and more infinite than it appeared before. The distinction which learning and scientific labors confer is not looked for in the ruler of a State, from the numerous duties and great responsibilities incident to that high station, and that it is so exceptionable must be my excuse for referring to it in the presence of Dom Pedro, in whose house or lineage, however, it seems to be hereditary; for we are told in the immortal novel of Cervantes, that when the barber and the curate were employed in devoting the whole of Don Quixote's library to the flames, they came across one book which they both agreed should be saved, because it was written by a learned king of Portugal.

In an age like ours, so marked by a wide-spread activity in every branch of science, it is of the greatest importance that the governments of the world should be in sympathy with this prevailing impulse; for the aid of governments, pecuniarily and otherwise, is necessary for the prosecution of at least some of the sciences with the breadth and comprehensiveness which has now become indispensable. This is especially so in the wide field of the science for the advancement of which this Society was organized, embracing as it does the whole surface of the globe, the land spread over it, the waters that cover it, and the air which surrounds it — a science requiring for its prosecution and exposition an enormous accumulation of details, that are to be obtained only by long-continued labors and pecuniary expenditures upon a very extensive scale. To the geographer, as well as to all who feel that scientific discovery is and must continue to be one of the great factors in the advancement of human civilization, it is of the deepest interest that the governments of the world should be fully impressed with what is due on their part to assist in the increase of scientific knowledge, and it is therefore with no ordinary feelings of respect and pleasure that we receive and welcome at our meeting a ruler who has ever sought to impress this great duty upon his own government, and to enforce it in his high position by the striking spectacle of his own example.

Colonel T. Bailey Myers then rose and said:

Mr. President, I am delegated by the Council of this Society to propose the name of Dom Pedro d'Alcantara as an honorary member. It would be unnecessary to add a single word to what has been already said, but if any argument were required to show what a source of congratulation it would be in future to add so illustrious a name, it would be the fact that that gentleman sits with us to-night as a private citizen.

The emperor was elected by acclamation, and was welcomed with enthusiastic applause, in the midst of which he came forward, the whole audience rising and cheering vigorously. The gentlemen upon the platform remained standing while the emperor spoke as follows:

THE EMPEROR DOM PEDRO'S ADDRESS.

"Although sincere gratitude's voice is always eloquent, I still hesitate to utter my thoughts to the American Geographical Society for the honor it confers on me in the presence of men so prominent in geographical science, and such indefatigable explorers of a region where man, rivaling as it were with nature, feels that labor is his greatest glory and most solid base of happiness. On so solemn an occasion, however, it is my duty to express how in my country we prize geographical studies, which bring to light its elements of wealth, and secure for it — I speak as a Brazilian, but without partiality — a brilliant future and also make it useful to all nations, with which Brazil has always endeavored to maintain a cordial friendship. I trust the American Geographical Society will allow me to express here a feeling adieu to all the people of the United States, who welcomed me with so much kindness, and to explain to them at the same time how sorry I am that a motive, doubly regretable, has not permitted my remaining longer among them, to see and examine as much as I desired, notwithstanding the means employed by this great nation to overwhelm time." [Loud applause.]

Dr. I. I. Hayes, the celebrated Arctic explorer, was then introduced and spoke as follows:

DR. I. I. HAYES'S REMARKS.

I felt much honored, Mr. President, when, in arranging the plan for the present evening, you assigned to me the duty of saying in behalf of the Geographical Society, some words of welcome to one of the most distinguished explorers of the present time — I mean, of course, Professor Nordenskjöld, of Stockholm, Sweden. I regret exceedingly to learn, by the letter you have read to us, that he cannot be present with us to-night, but is on his way to Europe.

Fellows of the Geographical Society, Ladies and Gentlemen, in view of the circumstance that Professor Nordenskjöld is not here, it may not be amiss for me to occupy, even at this late hour, a few moments of your time to solicit your attention to some of the important features of the explorations of our absent friend — absent I know he is, not in consequence of any indisposition on his part,

but for the simple reason that he is now bound on his way, for the fifth time, to the frozen regions of the North — not now with the view of reaching the north pole of the earth, but with the practical view of opening up to the advantage of commerce the great rivers Obi and Yenisei, which flow through Siberia to the Arctic ocean. In a few days he will take ship and sail for those distant regions. As long ago as 1854, Professor Nordenskjöld was conspicuous before the world for the developments he had made in Arctic discovery and in Arctic science; and it affords us the highest satisfaction to know that, after fitting out expedition after expedition from his native land, pushing them forward with all the ardor of his nature, our distinguished visitor, Dr. Petermann, has not withheld at any time the support of his great name and of his powerful influence to assist Professor Nordenskjöld in his great, noble, and heroic efforts to develop the resources of the North. [Applause.] And, indeed, while we have listened to the words of wisdom that have fallen from the lips of Dr. Petermann, we may wonder whether he has not himself penetrated into those remote and desolate regions, and yet our friend Bayard Taylor has told us that he has not, but that, like Von Moltke, he directs the great machinery by which, in the course of a few years — in the course of his own short life — there has been developed more geographical knowledge than had been evolved in all the centuries that had gone before. [Applause.] And to Dr. Petermann we must attribute, in a large measure, this wonderful development. And I congratulate you, fellow members of the Geographical Society — I congratulate the Society itself, of which I am proud to be a member — more proud to-night than at any other time of my life — when we have added to the roll of our honorary fellowship the name of so illustrious a sympathizer in the work which unites us, not as a formal compliment, sent to him at a distance, but as one of the audience we have the honor to address — and when we also have the honor of receiving one who, as the president has stated, has done so much for geographic progress, that we feel almost as if they were fellow-citizens among us, and as if the lines that divide peoples were broken down, and that there were a universal confederation among the nations of the earth, brought down to the level of our interest in, and our affection and devotion for, geographic knowledge. [Applause.] Geography is indeed the science of all sciences which blends men together in one universal comity of feeling and affection; for in that science do we find all the other sciences combined. Each in its own way, one science after another pays tribute to it to make a grand total.

That total is summed up in the one word, "Geography," — and to that one word our honored guest here, Dr. Petermann, holds the key. [Applause.]

Now, with regard to the Arctic regions, let me say one word. It is a region in which, in former years, I have been greatly interested. I have penetrated there four different times, and though I have not exactly been upon the track of Professor Nordenskjöld at any time, yet he has broken almost as far through the great barrier which invests the Arctic sea as any one has done at any time in any direction. ' The Austrian expedition, in which Dr. Petermann had so large an interest, penetrated nearer to the north pole and discovered land nearer to the north pole than any on the Atlantic side — far away to the north, along the land which was discovered originally in 1854, and re-discovered by myself in 1860, extending it nearly to the same latitude as the German exploration ; and while at the same time other developments were made, and discoveries made which were predicted by Dr. Petermann, upon the Behring's Straits side. The result of these explorations of Professor Nordenskjöld and the Germans has proven the fact that around that great region investing the north pole of the earth, which is shown on the map before you, there is a vast barrier of ice, and within it, what I have always advocated before this Society, is an open, free and navigable sea. [Applause.] Dr. Petermann and I have had some difference of opinion as to the stretch of land in that direction, but I am sure that that vast expanse of sea — almost 3,000 miles in diameter — that great waste of water rolls as wildly throughout the winter as throughout the summer, and dashes against its icy walls as wildly as the waves of the Atlantic or the Pacific ocean, and that if we could once break our way through that barrier into that sea, we should find it as navigable as any sea upon the whole earth, either in summer or in winter. [Applause.] The discoveries of Nordenskjöld or others, will not prove that there is any milder climate around the north pole than at some distance to the south of it, but that vast expanse, which is kept open by the motion of the waves and the air, which is necessarily receiving radiated heat from that body of water, is somewhat modified in its temperature. It is a cold, desolate region, yet in consequence of the vastness of the area of that sea it is, in my judgment, perpetually open. It cannot be open, however, if the land which Dr. Petermann suggests stretches far away from the north pole and towards Behring's straits. But I must differ from Dr. Petermann in that particular. I believe that the line marked upon the map there around that great area, marks nearly

the actual line of the land investing the great sea. We have a great current, a continuation of the Gulf stream, sending the tepid waters of the equatorial regions far away into the north, while, on the other hand, there is a cold current sweeping down Baffin's bay and working its way down along the eastern coast of America, giving cooling and refreshing water to the bathers of Newport and Long Branch. But for that current this eastern shore could never have been inhabited by man.

Now, ladies and gentlemen, with this brief outline, which is all I can do now, in obedience to the call which was made upon me by the president, I will close my remarks. But, first I will take the liberty of expressing my opinion with respect to recent explorations in the Arctic regions. It is my opinion that the English expedition which has passed up through Baffin's bay into Smith's sound, taking the track first followed by Dr. Kane, then by myself, and afterwards by Captain Hall — that the expedition from which we have not heard for a long time, but from which we will hear soon — that that expedition will push its way through the icy waters of Smith's sound, and over the ice wherein they may be inclosed, into the great sea which Kane discovered, and which I re-discovered afterwards. On the waters of that great sea they will be able to launch their boats and push onward to the north pole. But if they do not accomplish this result, if it is not for the English flag first to float over the north pole, I hope the time will come, and that not far distant, when either I or some other American citizen will lead an expedition up to Grinnell Land, in latitude eighty-two degrees — where I planted a little flag in 1861, and where it is standing at the present moment, unless the bleak Arctic storms have rent its starry folds — and picking it up, will carry it on and plant it — first of all flags — upon the north pole of the earth. [Applause.]

The president then declared the meeting adjourned.

TWO MONTHS IN BURMAH.

By Frank Vincent, Jr.

It would seem a difficult task at the present day to find any spot on this globe which the curiosity of man has not explored. Chief Justice Daly, of New York, in his interesting account of the geographical work of the world for 1873, recognizes this fact, but is compelled to acknowledge that one-seventeenth of the earth's surface yet remains unexplored. In addition to this, there are other portions of the globe of far greater interest to us than the unexplored regions, but concerning which we know virtually nothing.

Among Asiatic countries there are probably none where civilization abounds of which we are so ill-informed as of those which lie between the Bay of Bengal and the China sea, and which unitedly constitute Farther India or Indo-China. Possessing an area of 1,000,000 square miles, immense mineral wealth, a wonderfully productive soil, and 25,000,000 inhabitants, yet our knowledge of this territory might have been summed up in the words "Siamese Twins" and "Cochin-China chanticleers," so absolute has been the seclusion and conservatism by which the inhabitants have separated themselves from the rest of the world.

I can speak to you now only of Burmah, where my opportunities for collecting information, both by careful observation and deliberate research, were unusually good. I not only enjoyed the honor of being presented to the king, but visited all places of interest with suitable credentials, and was permitted considerable insight into the domestic customs, the religion, literature, laws and character of the people, mixing freely with both high and low. And though my theme possesses much of traditional picturesqueness and romance, I think that an idea of the history, present condition, capabilities and prospects of this remote and wonderful land may be best conveyed to you through a narrative of facts and events, rather than of fancies or philosophies.

On the latest and best of our atlases Farther India comprehends six independent countries or territories: Burmah, Laos, Siam, Cambodia, Cochin-China and Annam. Burmah, occupying more than

one-fourth of the great peninsula, is the most westerly of these provinces, being situated next to the Bay of Bengal and the Bengal presidency of Hither India. It is a state perhaps 1,200 miles in length and 600 in width, or as large as New York, Pennsylvania, Virginia, Ohio, Indiana and Kentucky together. The northern portion is somewhat hilly, while along the valley of the Irrawaddy, which traverses the country from north to south, lie rich alluvial plains, which are especially fertile in the vicinity of the deltas on the southern coast.

Two seasons — the wet and the dry — nearly divide the year between them. The south-west monsoon blows from May to October, and the north-east during the remaining months. The difference in temperature between the northern and southern parts of the country is great. North of the capital, which is centrally located, it seldom reaches 60° Fahrenheit, while in the south the mercury, in the hot season, often reaches 120° in the shade. Although this may seem hot enough for any place in *this* world, there are other parts of Southern Asia still hotter. Notable among them is Ghuznee, where the heat is so intense as to be matter of remark even among the salamandrine natives, for it is a common query with them, "Mighty Allah! why hast Thou made hell when there is Ghuznee?"

The early history of Burmah, like all early history, is obscure. Prome, one of the principal cities, is said to have been founded 400 years before Christ. Paghan subsequently became the capital, and remained so for twelve centuries. But historic records are very meager until the beginning of the sixteenth century, when the Portuguese made settlements. Then came English and Dutch colonists, who were unsuccessful and were subsequently banished. Wars between the Burmese and their neighbors ensued. In these conflicts England and France became involved. The latest war between Great Britain and Burmah terminated in 1853 (the year of the accession of the present king), by the annexation of the rich province of Pegu to the already enormously extended British empire in the east.

It is now generally believed that the ancestors of the Burmese, and indeed of all the various races and nations of Indo-China, migrated at a remote period from the plateaus of Central Asia — say Thibet or Mongolia. The northern portion of Burmah is inhabited even now by a few Tartar tribes — perhaps descendants of one of the marauding troops of Genghis Khan. Ethnologically speaking, though probably a distinct race, the Burmese bear more resemblance to the Turanian than to the Aryan families. They have the physiognomy

and physique of the Monguls — the small oblique eyes, high and prominent cheek-bones, straight black hair, flat, short and broad nose, short and stout body, and yellowish-brown skin. As compared with the Hindoos, they are more robust, but less active; as compared with the Chinese, they are more comely, though of darker complexion. Their language resembles the Chinese in being monosyllabic, but it contains also many elements of the Sanskrit; while their religion is that of Ceylon and Thibet. The entire population of Burmah is now estimated at 5,000,000.

I found the Burmese a simple-minded, indolent people, frank and courteous, fond of amusement, delighting in gay-colored apparel, friendly among themselves, and hospitable to strangers. Instead of entertaining the numerous ambitions of an American, the Burmese set modest limits to their desires, and when these are reached give themselves to repose and enjoyment. They thoroughly appreciate a quiet life, smoking, gossiping and sleeping throughout the day, while half the night is spent in singing and listening to wild music. They do not wear themselves out in endeavoring to equal or surpass their neighbors in dress, food, furniture or house, but easily attain the customary standard, beyond which they do not care to go. The Burmese commandments are: I. Thou shalt not kill any living creature. II. Thou shalt not steal. III. Thou shalt not give thyself up to carnal pleasures. IV. Thou shalt not lie. V. Thou shalt not drink wine or any intoxicating liquors. These precepts are all tolerably well regarded, save the fourth. The mendacity of the Burmese rivals that of the Persians and Arabs. A person who tells the truth is regarded as a good, simple character — in fact, a fool, who will never get on in the world. Among such a kindly-minded, affable people, one would expect an appreciative disposition, yet gratitude for a favor is almost unknown. There is no such phrase in the Burmese language as "I thank you." Servility and humility, however, they possess in no unstinted measure. They not only consider themselves slaves before the king, adoring him upon their knees as if a god, but before any one who happens to be superior in possessions or age, a Burmese will always refer to himself in the third person singular, as "your slave." The Siamese are equally obsequious. Thus a common man dares address a dignitary only when crouching abjectly before him and styling himself "your slave — a hair — a little beast."

Burmese houses are built of teak-wood, palm-leaf, bamboo, rattan

and grass, and are generally raised upon wooden posts four or five feet above the ground, to provide against the inundations of the rainy season, and also as a preservative from the fevers which are bred by the dampness of the climate. The villages often consist of but one long, broad street, running through perfect jungles of date, banana, palm or other tropical trees; and beneath and among these, nearly concealed from view, are the native huts, shops and monasteries.

In the fine art of tattooing the Burmese are excelled only by the New Zealanders. The operation usually commences in the seventh year, and is expensive, slow and painful. To allay the suffering, opium is often administered and deaths from an overdose of this drug or from inflammation, are not infrequent. The tattooing is usually performed from the waist to the knees. The upper part of the body is sparingly stained a vermilion tint, but the face is never tattooed. The figures, which are indelibly insinuated by a dark-blue pigment, are those of animals, birds, demons, genii, and cabalistic letters. They are first painted upon the surface of the body and then punctured by needles which have been dipped in the coloring matter. The women abjure tattooing, but stain their teeth black. This is always done upon their marriage, and when asked the reason of so singular a practice, the answer usually is, "What! should we have white teeth like a dog or monkey?"

The costume of the Burmese has a touch of Eden. Both sexes wear a short white cotton jacket, and the males a piece of gay colored silk or cloth about one yard in width and four yards in length, which is tied about the hips; while the women wear a nearly square piece of cloth or silk sufficiently large to wrap around the body, but secured merely by tucking the outer end within the other. The men wear red and yellow silk bandannas, in adjusting which they usually entwist a thick lock of hair; the women wear no head-covering. Both sexes leave their hair long; the men gather it in a bunch on the crown, and the women comb it straight from the forehead and tie it in a knot on the back of the head. The men seldom or never wear any hair upon their faces, unless it may be a very scanty mustache. Both sexes walk barefooted, though the women sometimes wear a sort of leathern shoe resembling the sandal of the Romans. The Burmese wear less jewelry than the Hindoos, though they take great delight in ear-ornaments. The lobe of the ear is bored, and the perforation is frequently enlarged to the diameter of an inch. Various articles are therein suspended, such as pieces of wood, jewels, rolls of solid silver or gold. When no auricular ornament is worn, these per-

forations are often used by the men as cigar-holders, and by the women as bouquet-holders. In either case the spectacle is exceedingly ludicrous.

The diet of the Burmese is plain and wholesome, save among the lowest classes, who, I found, did not despise ants and beetles. Even lizards tickle their palates and snakes gratify their gastronomic nerves. As my hearers doubtless know, the general food of the nations of southern and eastern Asia is rice. With the Burmese, salted fish, rice and spices constitute the solid and substantial part of the meal, while betel-nut and the cheroot always make an enjoyable dessert. A condiment, for which there is very great demand, is made of preserved fish — fish which has arrived at that epicurean stage termed "high." The betel-nut is extensively used, and most houses have near them trellises of the piper-betel plant, which is chewed with the nut. Smoking is universal and continual with both sexes and all ages. Cheroots of solid tobacco, but more often preparations covered with a green leaf wrapper, and sometimes of enormous size, are used. Burmese boys take to smoking even earlier than American youths. I have frequently seen a babe in arms sandwiching its natural occupation with pulls and puffs at the maternal cheroot!

The Burmese men are remarkably indolent. The industry of the women is involuntary; the men compelling them to do all the household work, at least the heaviest and most irksome part of it. The husbands, chatting and smoking, will sit where their wives are at work, or else lie stretched asleep upon the ground. If you give these natives just sufficient rice and fish-sauce to keep them from starvation, they will not work for even one dollar a day — a great sum for them. Deprive them of these luxuries and they will cheerfully work for a shilling a day — the customary rate of wages. However, like their neighbors, the Chinese, the men make excellent carpenters and blacksmiths. They also excel in cutting and polishing precious stones, in bell-casting, and in the manufacture of earthenware. Near Mandalay, the capital, stands the second largest bell of the world, being only surpassed in size by that at Moscow. It is twenty feet high, weighs ninety tons, and could easily contain twenty people. I have seen earthenware jars of their make which would contain 180 gallons. The women weave, upon odd-looking looms, silk cloths with beautiful colored stripes. But if sober work is not popular with the Burmese, *play* is. Strange to say, their principal indoor game is chess. In general character it resembles our own favorite game, though the "pieces" are different in number and names. Cock-fighting is

almost as great a passion as in the Philippine Islands, where nearly every man you meet in the towns will have his pet bird under his arm ready for a match at the shortest notice. The manly sports are also very popular. Indeed, the athletes of England or America can teach little to the boxers and wrestlers of Burmah. Finally, in order that you may estimate the degradation of this people, it becomes my painful duty to tell you that even the sagest and most accomplished Burmese knows nothing of that mysterious art which hangs inspiration upon the lips of every youngster in America — the art of whistling! That natural music of enlightened hearts is unknown in benighted Burmah.

Perhaps none of the customs of the Burmese are so peculiar as those connected with their courtship and marriage. Their mode of kissing is like that of the Polynesians. They apply the mouth and nose to the cheek, draw in the breath, and say, "Give me a smell." When a young Burmese gentleman desires to marry, he does not, like Jacob, have to serve the father of his betrothed for seven years in hard labor, though, if the family approve of the match, he is obliged to reside in the house of his future father-in-law for three years. At the termination of that period he may consider himself married, and may take the young lady away to live with him. Thus he gets acquainted with his wife before he marries her. The first night after the marriage, instead of presenting congratulations, the neighbors collect together and throw stones and logs on to the roof of the house, and to avoid these delicate attentions, for which I could obtain no explanation, the greatest secrecy is always observed by bride and bridegroom. Sometimes, if the families are of very noble lineage, the following wedding ceremonial obtains: On the morning of the bridal day the bridegroom sends to the maiden three colored robes, three sashes, three pieces of white muslin, and such jewels, earrings and bracelets as his circumstances will admit. A feast is then prepared by the parents of the bride and formal contracts are executed, after which the two eat out of the same dish, and the bridegroom presents the bride with some pickled tea, which she accepts, returning the compliment, and this completes the nuptial rites. Polygamy is extensively practiced by this people, though but one or two women are recognized as wives.

A husband may punish his wife in the following instances: I. If she is accustomed to drink wine. II. If she is careless of her domestic duties. III. If she encourages any gallant. IV. If she is fond of running about to other peoples' houses. V. If she habitually daw-

dles at the door or window. VI. If she is petulant and quarrelsome with her husband. In like manner, it is lawful for husbands to punish those wives who are very extravagant in dress or eating, those who show a disregard of modesty, or a too great curiosity, and those who by reason of their beauty or their dower are proud and overbearing. In these cases a husband must always at first bear with his wife patiently, and admonish her in the presence of others; but if she does not amend, he may then punish her, and even beat her. If, after this, she still continue her evil habits, he may put her away, *nolens volens*, dividing with her the property. As you will readily believe, the marriage knot is, under these conditions, rather loosely tied. The elsewhere often difficult task of severing the bonds of matrimony is in Burmah accomplished by this simple and beautiful process: If two persons become tired of each other's conjugal society they light two candles, shut up the house, sit down, and wait quietly until the candles are burned out. The one whose light is first consumed, gets up at once and leaves the house forever, taking nothing but the clothes worn at the time. Perhaps it would not be too much to prophecy that, were this custom suddenly to obtain here, chandlers would become millionaires, and we should evolve a tallow and spermaceti aristocracy.

Having now given a somewhat general and hasty view of Burmah and the Burmese, I shall proceed to the narrative of my visit in that country. In April, 1871, I landed at Rangoon, the principal city in southern Burmah, situated on the Rangoon river, not far from the sea. From here I determined to make an excursion up the great Irrawaddy as far as Mandalay, the capital of Burmah, to pay my respects to His Majesty King Mounglon. One of a large flotilla of English steamers runs monthly to Bhamo, nearly a thousand miles from Rangoon, and there are weekly trips as far up as the capital. Having secured passage in one of these steamers, at noon on the second day from Rangoon we wheeled into the Irrawaddy, one of the largest of the many large rivers of India, and the great highway into the dominions of his golden-footed majesty the king of Burmah. The length of this celebrated river is probably about 1,400 miles, though its source has not yet been actually discovered.

One of the principal places at which we stopped was Paghan, a city founded over 1,500 years ago, and containing the most interesting remains of antiquity to be found in Burmah. The ruins — some of which are believed to be more than 1,000 years old — extend for eight miles along the bank of the river, and two miles inland. They

are of remarkably fine brick and plaster, built very massively, and nearly all are temples or pagodas, excepting a portion of brick wall and part of an old gateway. The temples are of all sizes, shapes and colors. Nearly a thousand are said to be still standing. They contain large rooms, having carved, gilded and painted ceilings, with Grecian and Gothic arches. In the temples are many images of Buddha, made of alabaster or brick and painted red; some are twenty feet in height. Paghan was abandoned over 500 years ago, but its temples are still held sacred, and are regularly visited, for here it is said the doctrines of the "new religion" of Buddha were first proclaimed in Burmah. Though this is doubtless true, still the various forms and contents of the pagodas and temples now remaining render it somewhat doubtful what people were formerly the builders or possessors of Paghan. Thus, besides the purely Buddhistic monuments — upon which I recognize characters almost identical with the inscriptions upon the great Buddhist temples of Java — some images bear remarkable resemblances to those of the Egyptian fetichism; others are of a Brahminical or Hindoo character; and the greater number, wonderful as it may seem, bespeak, though indirectly, a Christian origin, or rather they indicate elements of the Christian faith, which, as I shall soon show, have evidently been incorporated with the doctrines of Buddhism. Many of the vaulted temples at Paghan take the forms of Greek crosses, after the manner of European cathedrals, and have steeples much resembling Romanist mitres. On one side of one of them is a figure of a priest, which is the exact counterpart of the statue of an English archbishop of the middle ages. He stands in a long gown, having over his head an umbrella which bears a remarkable resemblance to the circular covering of a cathedral pulpit. Near Paghan the bank of the river rises in a high sandstone bluff, into the almost inaccessible face of which are cut many small chambers or cells, the abode of ascetic priests. The Burmese, like the Hindus, deem it meritorious to mortify the flesh. In this matter of solitary seclusion we have perhaps an imitation of the monkish superstition which prevailed in most European countries 500 years ago.

I am brought by these facts to speak of Buddhism, the great religion not only of Burmah but of all Farther India. For, whether observed in the light of its diffusion — its followers embracing more than one-third of the population of the world, though not extending beyond the limits of Asia and the adjacent islands — or whether regarded in the exalted nature of its precepts, most of which are also

found in our New Testament, Buddhism certainly claims the attention of every inquiring mind. Though, like other religions of the eastern world, it contains many revolting errors, absurd fables and contradictory statements, still its many capital maxims and its pure morals entitle it to be termed the most perfect system of belief ever invented by man. "It has no mythology of obscene and ferocious deities; no sanguinary or impure observances; no self-inflicted tortures; no tyrannizing priesthood; no confounding of right and wrong, by making certain iniquities laudable in worship."

Historical students had for a long time entertained very diverse opinions concerning the origin of Buddhism. Some had thought that with the exception of Brahminism, it was the most ancient of Oriental religions. Others had supposed that it was the primitive faith of Hindostan. Some had fancied that Buddhism was eliminated from the gross pantheisms of Egypt and Greece. A few had even essayed to identify Buddha with the Hermes of the Egyptians. The Jesuits would persuade us that Buddhism is of Nestorian origin. Traces of this ancient faith are said to have been found in Swedish Lapland. Endeavors have been made to prove Buddha one and the same with the Woden of the Scandinavians. Stonehenge has been called a Buddhist temple. And the question has been raised whether there may not have been much of the marrow of this system of belief among the Celtic Druids. But, notwithstanding all these conjectures and speculations, Buddhism is now generally believed by oriental scholars to have originated in the fifth century, B. C., to have sprung up in Nepaul, a country lying contiguous to India on the north.

Probably nothing about Buddhism is so remarkable as the parallel its history presents to that of the Christian faith. "Both originated in members of royal races; both won their way by preaching and by the practice of manly virtues, honesty and truth; both firmly established themselves after 300 or 400 years, by becoming State religions; both gradually corrupted for about a thousand years until a revolution reconstructed them; both were driven from the lands of their birth, and are now professed by aliens and strangers to their founders." But while all this is strictly true, and also that Buddha died 475 years before the birth of Christ, still you must remember that it is well proven that the early growths of Christianity and Buddhism were entirely distinct from each other. Though the rock-inscriptions and literature of India attest the originality and priority of Buddha's work, at the same time "the light of history shines clearly on the origin of Christianity, and places its perfect independ-

ence of extraneous suggestion beyond cavil." The French philosophers, you know, tried to find in the Buddhism of Thibet the origin of Christianity. And, indeed, the similarity between the Buddhist and Roman Catholic ceremonies has been noticed by many travelers and scholars. At the present day in Thibet, as I can myself testify, one finds almost all the ordinances and paraphernalia of the Romanists — "vows of celibacy, fasting, prayers for the dead, vespers, penance, rosaries, images (of the queen of heaven), holy water, relics, bells, candles, missals, incense, shaven crowns, monks, nuns and friars." Prinsep, the antiquarian, may possibly be right in assigning the origin of the legend of Prester John to the accounts which the early missionaries brought of the Tale Lama of Thibet — the pope of Asia — though I think many of the doctrines of Buddhism have been derived indirectly from Christianity, rather than the contrary. The Nestorians flying from the persecutions of Rome, spread their doctrines in the far regions of the east. From India Buddhism emigrated to Thibet, where these Christians already had ecclesiastical settlements, having found a fertile soil for the transplanting of a religion which, surrounded by all the splendor of idolatry, contained hardly any moral truth at variance with the spirit of Buddhism. Before this time Italian and French priests had visited the court of the Khans, charged with important missions from the pope. These padres carried with them church altars and ornaments, and used music, paintings and ceremonials in their chapels to make a more favorable impression on the minds of the natives, just as their brethren do at the present day the world over. And the simple-minded natives then, as now, admired and gradually adopted the gorgeous rites of this religion. The splendor and pomp of the Buddhist Lamas were augmented by those of the Catholic monks. At first the Buddhist patriarchs who went to Thibet were dependent upon the civil power, and their archbishop stood in much the same relation to the rulers as did the mikado of a few years since to the tycoon of Japan. But afterwards the head of the religion received the sovereignty, amalgamating the pontifical and secular duties of the State, as also did their majesties in Japan. The coincidence of time and place, and the known fact that the sacred monarchy of Grand Lamas did not exist before the twelfth century (A. D.), seem to demonstrate conclusively that the religion of Thibet as it is to-day is but an imperfect imitation of the Roman Catholic. And the lesser spurs of the same gigantic religious system — those trending to China, Japan and Farther India — either copied

their theological institutes from Thibet, or, which seems more probable, received them directly from Ceylon.

The similarity between the Buddhist and Catholic priesthood is also very striking. In Burmah they have a religious order with a distinct hierarchy. The archbishop resides at Mandalay, the capital, and has jurisdiction over all the priests and monasteries of the country. At court he takes precedence of the mandarins as the cardinals outrank the ministers in European countries. In the Burmese priests I was continually reminded of the monks of Europe in the middle ages. They do not marry, but live apart in monasteries. They own no property, but subsist entirely by the charity of the people. They wear a particular dress of a yellow color, shave the head and walk barefooted. They have the confessional, use the rosary and practice austerity and humility. Their time is taken up with religious observances and study. They wholly eschew the society of women, and should even the mother of a member of this ascetic brotherhood fall into a ditch, her son (if a priest) may not pull her out. If she be in real danger, and no other aid is at hand, the monk may offer her his robe or a stick to help her out, but at the same time he is strictly enjoined to preserve his sacerdotal purity by imagining he is only pulling out a log of wood! At any hour of the day, and indeed at almost any hour of the night, if in the neighborhood of a monastery, your tympanum and your tranquillity will be assailed by low, monotonous, *interminable* chants. Do not be alarmed, however, it is only the priests repeating upon their beads what are known as the four considerations on the four things more immediately necessary to men, to wit: food, raiment, habitation and medicine. "I eat this rice, not to please my appetite, but to satisfy the wants of nature. I put on this habit, not for the sake of vanity, but to cover my nakedness. I live in this monastery, not for vain glory, but to be protected from the inclemency of the weather. I drink this medicine merely to recover my health, that I may with greater diligence attend to the duties of my profession." And these eminently proper and self-satisfying asseverations they are required to repeat 120 times every twenty-four hours! During life the greatest respect and deference are paid to their priests by the Burmese, and after death, their bodies are embalmed and burned with rites which are curiously compounded of solemnity and buffoonery. The process of embalming is in most respects like that of the ancient Egyptians. The viscera having been removed, the body is first filled with spices. Next it is covered by a layer of wax, and over the wax is placed a layer of lac and bitumen,

and the whole is then gilded. About a year afterwards the body, set in a coffin painted with various figures of death, is publicly burned upon a pile of bamboo. Sometimes the cremation is varied by the sensational act of blowing the body from a cannon, that it may be conveyed more quickly to heaven.

I wish I had time to give you some adequate idea of the sacred doctrines of Buddhism, but my limits will permit me to notice only some of the most peculiar. The sacred language of the Burmese is the Pali, as is the Sanskrit that of the Hindoos. The Buddhist Scriptures are divided into three parts: The Instructions, the Discipline, and the Metaphysics. These embrace about one hundred volumes. An eminent Buddhist reformer once defined the duty of the different classes of Buddhists in the following manner: —

"Men of the lowest order of mind must believe that there is a God, and that there is a future life, in which they will receive the reward or punishment of their actions and conduct in this life.

"Men of the middle degree of mental capacity must add to the above the knowledge that all things in this world are perishable; that imperfection is a pain and degradation, and that deliverance from existence is a deliverance from pain, and consequently, a final beatitude.

"Men of the third or highest order must believe, in further addition, that nothing exists or will continue always, or cease absolutely, except through dependence on a casual connection or concatenation. So will they arrive at the true knowledge of God."

If I hear you say, "What is this but Christianity, wanting only the name of Christ as its preacher and the Mosaic faith for its antecedent?" I reply: "There is another side to the picture; and it is proper that, having seen the good, you should also see the evil there is in this ancient oriental faith."

A certain class of people in this country, in their eagerness to get clear of Christianity, are just now looking to and praising Buddhism as the *summum bonum* of life and the goal of all human wishes. But while admitting that it may be the best religion man has ever made for man, I do not by any means agree with those so-called modern philosophers who would place it on the same level with Christianity; for, when shown in its true colors, it is unsatisfying and soul-destroying in its tendencies. "At its best, Buddhism knows not a Creator, and Buddha is not a Saviour. Paradox though it may be, Buddhism is but a polytheistic atheism." It is founded on a false and rotten basis — that of personal merit, and not love and fear of God.

Indeed, Buddhism has no actual God — annihilation is the aim and end of man. And so far as the great bulk of its devotees are concerned, it is the most gross and degrading idolatry. As fatalists the Buddhists rival the Stoics, the Turks and the Arabs. The belief in an invincible and inevitable necessity, a fixed, unalterable course of things, prevents an endeavor on their part to control the present or prepare for the future. Probably no nation in the world, excepting the Hindoos, are so superstitious as the Burmese. They practice astrology and divination; they believe in dreams and witches; they wear talismans, and they use love philters.

Mandalay, the Burmese capital, is distant about 200 miles north from the ruins of Paghan, and is situated on a large plain three miles from the east bank of the Irrawaddy river. The city proper is a square — a mile on each side — and is surrounded by a lofty and thick brick wall having a notched parapet. At irregular intervals are turrets, and the gateways are surmounted by pyramidal towers. Before the wall is a broad and deep moat, filled with clear water and crossed by massive bridges to the city gates, of which there are three on each side. The latter are of enormous height and thickness, and are built of teak beams fastened together with huge iron bolts. Macadamized avenues about 100 feet in width lead from these and intersect the city at right angles. Between them are small irregular streets and by-paths. Along the sides of the larger thoroughfares run channels for carrying water, which is brought from the river in an aqueduct fifteen miles long. The houses of the capital are mostly frail structures of bamboo framework and mat covering, with grass or palmleaf-thatched roofs. They are raised upon posts some four or five feet from the ground — a precaution against inundations and dampness. In the principal streets many houses are built of brick, or large bricks are *nailed* to the sidings, and then the whole exterior is thickly plastered with mud. Some of the Chinese shops are two stories in height, and present a very neat appearance. Numbers of pagodas, temples and monasteries may be seen in all directions. Several Asiatic nations are represented in Mandalay, the population of which is about 100,000; but the trade of the city is mostly controlled by the Chinese. The Europeans number but fourteen all told, some of them being officials of the English government, while a few are engaged in trade.

I was indebted to an influential Chinese merchant resident in Mandalay for my admittance to the palace and audience with the king of Burmah. The outer palace-walls are double, the one being thirty feet distant from the other; both are built of brick, and the

inner incloses about seventy-five acres of ground. Near the gate at which we entered were some barracks and a guard-house, before which, standing in a row, were five of the king's soldiers. They wore brass hats, shaped somewhat like a broad-brimmed panama, and red coats of the British army pattern, but their legs and feet were bare. It is not always, indeed, that Burmese soldiers adopt even so much uniform as this; their profession can often be detected only by the tatooed marks on the back of their necks. The sole weapon of the guards was an immense iron cleaver. We walked into a large square, upon the right of which was a small pagoda, further on a bell tower, and in the left-hand corner a magazine and some buildings filled with light ordnance; next came the high court, and then the royal mint, while towering high above all rose the graceful spire of the magnificent hall of audience.

We passed around the high court — a large but not imposing building, painted red with gilt ornamental work — and were about to enter through another double line of walls, the inclosure which contains the palace buildings, when our attention was attracted by a regiment of native Burmese soldiers, who had been out at target practice. They marched by us in column, clothed in nothing but the waist cloth, and carrying huge rusty muskets closely resembling the historic blunderbuss of the sixteenth century. Judging from the appearance of these troops, I should say that a thoroughly equipped American soldier would prove a match for at least ten of them, and yet it has been said that the Burmese soldier fights well under most circumstances.

I visited one of the minor courts, and became much interested in the subject of Burmese laws and punishments. Perhaps, on the whole, the former are wise, and calculated to advance the interests of justice and morality, though they very often prove futile, owing to the tyranny and rapacity of the king, and the venality of many of his officers. And throughout Burmah I found the strangest minglings of truth and error, sense and nonsense. The laws are derived principally from the Hindoo Institutes of Menu. As in some unmentionable countries not nearly so distant, justice in Burmah is a benefit too precious to be lavished upon everybody. The severest calamity that can befall a Burmese is to be "put into justice." Criminal cases are generally tried before the governors of the towns. If the litigants are rich, the lawsuit is apt to be a long and costly one, and a decision is often given in favor of him who pays the highest. How different is all this in our more favored land! Trial by ordeal is still extant

in Burmah. Sometimes it is by trying which of the parties can remain longest beneath the surface of water; again, whoever can hold the finger longest in hot water or melted lead gains the cause. False swearing is particularly obnoxious to the Burmese citizen. A witness in court takes a fearful oath, which is made binding by chewing pickled tea after the ceremony.

Punishments for grave crimes are very cruel; for murder and treason, crucifixion, decapitation, burning alive and drowning; for lesser offences, the stocks, labor in chains, maiming, branding, imprisonment and selling into slavery. Corporal punishment by flogging is quite common. "The bamboo is here, as in China, the invariable instrument of castigation, and the fear of the cane — that schoolboy terror of the western world — may be said to hold all Eastern Asia in awe. Even the prime minister himself is liable to its infliction." The Burmese have also a system of forfeits and fines as punishments. Thus, whoever steals a horse must restore two; whoever steals an ox must restore fifteen; whoever steals a buffalo must restore thirty; whoever steals a pig or a goat must restore fifty; whoever steals a young goose or a fowl must restore one hundred; whoever steals a man must restore ten, or four if he only conceals him.

Like most semi-civilized people, the Burmese attach little value to human life. If a person is accidentally killed by another, reparation is made by paying the price of his or her body according to the following scale of value: A new-born male infant, two dollars and fifty cents; a female infant, one dollar and seventy-five cents; a boy, six dollars and twenty-five cents; a girl, four dollars and thirty-seven and one-half cents; a young man, eighteen dollars and seventy-five cents; a young woman, twenty dollars and sixty-two and one-half cents! Though all these are ridiculously low valuations, it should be favorably remarked that the greatest intrinsic worth is attached to their young women by the Burmese. It is hardly necessary that even casual reference should be made to the fact that the elephant is valued at fifty dollars, or more than double that of the most highly apprized human being.

After remaining in the court-room about twenty minutes, an officer came with a message that the king was ready to give audience, and so, preceded by two of the grand ministers, we approached the *mhan-gaw*, or crystal palace, passing through still another gate in a low brick wall. Soon after we reached a long flight of stone stairs, where we were requested to halt and remove our shoes. We then

ascended to another office, and our arrival being announced to his majesty, in a few moments we were summoned to a small pillared portico, open on two sides. At one end there was a golden door, which led to another chamber. At the other a large green curtain extended from the ceiling to a flat dais about four feet in height. In this screen was a small opening extending down to the dias, upon which were lying a red velvet cushion and a pair of silver-mounted opera-glasses. The roof of the portico was supported by immense pillars, grouped around the bases of which were the ever-present symbols of royalty — gold silk umbrellas. About half a dozen princes were in the audience chamber, among them the heir-apparent, an intelligent and handsome young man, plainly dressed, with the exception of a pair of immense cluster diamond ear-rings. Our presents were displayed before us, placed on little wooden stands. The natives were all prostrating themselves flat upon their stomachs, with their noses nearly touching the carpets, and their eyes cast down in a most abject and servile manner.

Soon we heard two or three muffled drum-taps, and then the king appeared and quietly laid himself down, reclining against the velvet cushion, and only partially facing the assemblage. At the same time one of his queens entered and placed a golden spittoon, a betel-box, an urn of water, and a drinking cup on the floor before him. All Burmese officials have a set of these articles, which are borne after them by their servants, and from their shape and material, both of which are regulated by law, one may determine their rank. The king was a short, stout gentleman, with a large head, closely set eyes, and short, thick neck. He appeared to be about fifty-five years of age. His dress was very plain and simple, consisting merely of a white linen jacket and a silk cloth worn around the hips and thighs. There were no ornaments in his ears, though their lobes contained holes nearly an inch in diameter, which did not give a very amiable expression to his countenance. The king first took up his opera-glass (though we were not more than twenty feet distant), and surveyed us in a very grave and leisurely manner, ending with a flourish which seemed to signify, "Now, then, what do you want?" But first the royal secretary read aloud our names, business, and a catalogue of the presents which were placed before us.

His majesty then began the conversation through the prime minister, my Chinese companion serving as interpreter. It seems I had the honor to be the first American presented at the court of Burmah, and that the king, in his astuteness, graciously thought me a spy, or

at least that I was visiting Burmah for political purposes, and consequently had some influence with, as well as instructions from, the government at home. It was in vain I protested that I was a simple traveler, visiting different countries for the purpose of studying their people and productions, and that I had journeyed about 12,000 miles more especially to pay my respects to the king of Burmah, and to see the wonderful white elephant, about which I had read so much in my own country. These complimentary avowals were to no purpose, for it was quite evident his majesty thought politics were surely my main object. After the usual questions concerning my age, business, residence and travels, the king said he wished me to convey to my government the sentiment that he had a great partiality for Americans, and wished them to come over and colonize in his dominions. In reply, I promised to make his wishes known to the proper American authorities, but this did not seem to be sufficient, for he answered that he would retain me in Mandalay while I wrote, and until word came from America. At this I demurred, of course, when his majesty said that if I would remain he would give me a house, living, and as many Burmese wives as I wished (a rather tempting offer, for the women of the upper classes are pretty, intelligent and modest), and furthermore, that he would make my fortune. In the flush of the moment, I felt myself fast becoming a Burmese, with a saving faith in Buddha, and the royal umbrella as my natural inheritance. His majesty wished to make also a commercial treaty with America, and my services would be indispensable. Thus were alluring nets spread about my ingenuous soul! Still, I was not then prepared to enter the king's service; the idea was too novel, the change — from democracy and woman suffrage to despotism and white elephants — too amazing. "I must have time to consider his majesty's gracious offers," said I to the interpreter. "You will never have a better chance," was returned from the king. Seeing me still reluctant, his majesty condescendingly offered to make me "a great man" — to give me high rank among his own nobles and princes. I found myself waxing preternaturally filial and patriotic, and answered that my duty was first to my parents and next to my own country, and that I would return to the latter and consult with the former, and if they were willing I should be most happy to accept his magnificent and gracious terms. He replied "it might then be too late." And there the matter dropped, and the conversation was changed to other topics, though the king was evidently not a little vexed at my obstinacy, and doubtless thought me mad or certainly very foolish. One of the

princes then presented some petitions, which were referred to the proper minister; some routine business was transacted, a valuable present was brought my unworthy self, and then the audience was terminated by the king's abrupt leaving.

One of the queens or concubines (he has four of the former and about a hundred of the latter), who, though out of sight, had, during the audience, been fanning the king with a gorgeous brush of peacock's feathers, now took a peep at us, of course exhibiting herself at the same time. Such a beautiful creature I had rarely, if ever, looked upon before, and perchance never shall see her like again. She was one of the veritable "houris of Paradise," an Oriental pearl, a Lala-Rookh siren, fed on buttered rose-leaves, and of indescribable loveliness and symmetry. I will not attempt a description; but the king's liberal offers came at once to mind, and I felt what a great sacrifice it would be to return to my native land, and refuse — nay, almost spurn — rank, wealth and beauty under the peacock banner and golden umbrella of His Majesty of Burmah.

Not always is the king dressed so plainly as on this occasion. Sometimes he wears ornaments of gold set with precious stones, the total weight of which is over fifty pounds. His crown consists of a lofty gold pyramid of filigree work, shaped like a Burmese pagoda studded with immense diamonds, rubies, sapphires and emeralds. Over each shoulder he wears a golden wing like a fairy.

The audience lasted over an hour. The king seemed to have very respectable ideas of America, and a high appreciation of the enterprise and industry of her people. Perhaps he wished Americans to settle in Burmah as a sort of political offset to the English, whose power and influence — now owning two-thirds of the ancient kingdom of Burmah — are naturally very great; but I think his main idea was simply to obtain from the United States a commercial treaty advantageous to himself.

As regards the events of the king's reign, much might be said of blame and something, also, of praise. The government is a despotism modeled somewhat after that of China, the king being the father of the state, the mandarins the fathers of the provinces over which they are placed, and the magistrates fathers of the subordinate departments in which they preside. Among many other of the royal titles I noticed that of "Lord of the Power of Life and Death." The king alone decides upon peace or war, and if the latter, the whole male population between seventeen and sixty years of age must serve. The entire country belongs to the crown. As with the emperor of

China, and, in fact, with all eastern rulers, so with the king of Burmah: vanity and pride are his characteristic traits. The self-styled "Son of Heaven" at Pekin, who believes that western nations are simply remote dependencies of the great "Middle Kingdom," and who considers foreign ministers as vassals sent to render homage and to reside at his court as hostages, is quite matched by the "Glorious Sovereign of Land and Sea" at Mandalay. The king of Burmah, however, in his government is assisted, and doubtless influenced, by four public and four private counselors, and four ministers of the interior. The Council of State, comprising the four principal ministers, are the executive officers of the government.

Possibly a fellow-feeling ought to make us wondrous kind to Burmah when we reflect that throughout the entire kingdom bribery and corruption reign supreme. Burmese revenue is obtained partly from house taxes, which are collected in money, and partly from taxes on the crops, of which five per cent in kind are taken. The king appropriates most of the revenue to his own uses, many of his ministers receiving no salary at all. His majesty's method of paying his debts is somewhat peculiar. He first buys goods of merchants at a low price, and then serves them out at a high price as pay to his troops or followers, who are afterwards compelled to sell them in the bazaars at a great sacrifice. The present king, however, has shown some appreciation of the advantages of western civilization. He offers good inducements to European mechanics and engineers to establish themselves in Mandalay, and has succeeded in bringing his country into telegraphic communication with India and Europe.

After we had descended the palace stairs we put on our shoes (which had been removed when we entered, agreeably to Burmese etiquette), and went to a neighboring building to see that very celebrated animal called the white elephant. The beast proved to be a male of medium size, with white eyes and a forehead and ears spotted white, appearing as if they had been rubbed with pumice-stone or sandpaper, but the remainder of the body was *black as coal.* Elephants of this character, although we should call them black, are styled by the Burmese *white* elephants. The one in question was a vicious brute, chained by the fore-legs in the center of a large shed, and was surrounded with the "adjuncts of royalty"—gold and white silk umbrellas, an embroidered velvet canopy above, and some bundles of silver-tipped spears in the corners of the room.

In Burmah and Laos the elephant is found in immense herds. He is very easily tamed, and is used with some effect in war,

though his services are still more valuable in domestic labors. At Maulmain, in the south-eastern part of Burmah, there are many large timber-yards, in which the usefulness, power, sagacity and docility of the elephant are most wonderfully illustrated. There these uncouth monsters are employed in drawing, stacking and shifting the immense teak logs — some of them weighing as much as two tons. A log that forty coolies could scarcely move, the elephant will quietly lift upon his tusks, and holding it there with his proboscis, will carry it to whatever part of the yard he may be directed by his driver. They will also — using trunk, feet and tusks — pile the huge timbers as evenly and correctly as one could wish. What surprised me the most was to see the elephant select and draw out particular timbers from the center of an indiscriminate heap of more than a hundred, simply at the command of the native attendant. The drivers, who always ride upon the necks of the elephants, direct these huge beasts by means of spoken orders, and by pressure of the feet on their necks or sometimes by the use of an iron goad. It usually requires a year, or a year and a-half, to teach them the lumber business, and when thoroughly taught they are worth from $250 upwards, according to their abilities. I saw one, a venerable old fellow nearly ten feet in height, for which the owner said he had refused an offer of $1,500.

Pure white albino elephants are rarely seen, but occasionally one with a yellowish-white skin — spotted more frequently than a solid color — with pink iris and scarlet rim around the eyes, is found in the forests of the central parts of Farther India. As a rule, white are quite as physically perfect, healthy and long-lived as black elephants under like conditions, whether in the cities of Mandalay, Bangkok or Panompin, or in the forests of Laos. They are of ordinary size and shape, and are captured of both sexes. Their color is a simple freak of nature, and not necessarily hereditary. They are held to be sacred by all the Indo-Chinese nations excepting the Annamese. They are revered as gods while living, and their deaths are regarded as national calamities. This extraordinary reverence for them is a traditional superstition and of most ancient date. We see something of the appreciation in which the elephant, both black and white, is held by these people in the titles and offices of their rulers and great men. Thus the king of Cambodia is styled "First Cousin of the White Elephant;" the prime minister of Siam, "General of the Elephants;" the foreign minister of Annam, "Mandarin of Elephants," while the kings of Burmah and Siam covet the pompous titles of "Lord of the

Celestial Elephant" and "Master of Many White Elephants." The grand lama of Thibet is said also to glory in the possession of one of these sacred monsters.

The white elephant has been happily termed the "Apis of the Buddhists." Its sanctity is due in part to the known Buddhistic reverence for white quadrupeds. Both the Burmese and Siamese possess albino monkeys, which are honored with special attention; and Darwin might find much comfort in the belief and saying of the Siamese, that "the monkey is a man — not very handsome, to be sure, but no matter, he is no less our brother." The fact that the white elephant is found only in Buddhist countries, and that it is so rare, probably gave rise to the belief that it must be the temporary abode of some mighty Buddha in his progress to perfection, and that in thus possessing this singular animal, they may also enjoy the presence of Diety and its attendant blessings.

White elephants have been the cause of many a war, and their possession is more an object of envy than the conquest of territory or the transitory glories of the battle-field. Once the king of Siam possessed seven of these sacred beasts, and the king of Burmah asked that two should be given him, which modest request being denied, the Burmese invaded Siam with a great army of men, horses and war elephants, marched upon the capital and captured four of the white monsters, instead of the two originally demanded. In the money market a white elephant is almost beyond price. One hundred thousand dollars would not represent its pecuniary value. Sir John Bowring, on the occasion of negotiating a treaty between England and Siam, some twenty years since, received many valuable presents from the king; but, finally, his majesty placed in his hands a golden box, locked with a golden key, and containing (he informed him) a gift far more valuable than all the rest, and that was a few hairs of the white elephant! In Burmah, a subject who may find one of these famous albinos, receives a present of a thousand dollars, is raised to the rank of Mandarin, and exempted thenceforth from all taxes. The repute in which they are held by the court and people, and the great anxiety there is to obtain them, sometimes causes the destruction of much property. Thus, on one occasion, when a report was brought concerning the projected capture of a white elephant which had been discovered, and the transport of which to the capital over the cultivated country would destroy 10,000 baskets of rice, the king is said still to have ordered the hunt, exclaiming, "What signi-

fies the destruction of 10,000 baskets of rice in comparison with the possession of a white elephant!"

It is quite true that, at the present day, the white elephant is worshiped by the lower classes. But by the king and chiefs it is venerated and valued not so much for its divine character — being the abode of a transmigrating Buddha — as because it is believed to bring prosperity to the country in peace and good fortune in war. It is part of the royal regalia, and the more there are of them the more grand and powerful the State is supposed to be. Ministers and a cabinet are appointed to wait upon the white elephant. A large endowment of land, frequently one of the finest districts in the kingdom, is set apart for its maintenance. When sick the king's physicians attend it, and priests pray for its cure. It is not only treated like a prince of the blood by the nobility, but is said to be the second dignitary of state, outranking the heir-apparent. This is not entirely correct. They really do, however, take rank immediately after the royal princes. The white elephant is the national emblem of nearly all the states of Farther India. One may see it upon flags, seals, decorations, medals and moneys. As is the cross among Christians, or the crescent among Moslems, so is the white elephant among the Buddhists.

To be compared to one of these unique beasts is regarded by the Indo-Chinese as a compliment of the highest possible character. One of the Siamese ambassadors who visited England a few years ago, thus speaks of the English potentate: "One cannot but be struck with the aspect of the august queen of England, or fail to observe that she must be of pure descent from a race of goodly and warlike kings and rulers of the earth, in that her eyes, complexion, and above all, her bearing, are those of *a beautiful and majestic white elephant.*" The feelings of her most gracious majesty upon receiving such a delicate manifestation of oriental flattery may be more easily imagined than described.

There is a report that a white elephant is now on the way to this country for exhibition, whether by Mr. Barnum or not I cannot guess; but I may assure you that no such animated abode of holy Buddha is in the Oriental market, nor would it ever be allowed peaceably to leave either of the august courts of Lhassa, Mandalay or Bangkok.

In a pavilion not far distant from the abode of the white elephant is the royal library. Some of the books are made of sheets of ivory, silver or copper, richly ornamented. There are others of which the leaves are covered with a hard black lacquer, upon which the words

are emblazoned in letters of gold. The king's books are contained in large gilded chests placed in rows against the walls of a great square room. The volumes are all numbered, and the titles are emblazoned on the covers of the chests.

The vernacular tongue of the Burmese has neither declension nor conjugation, and is very difficult for Europeans or Americans to learn. The Rev. Dr. and Mrs. Judson, the well-known Baptist missionaries, studied two years before making much, if any, progress in it. It is written from left to right, with no division between the words, and with letters most of which are circles or parts of circles. The alphabet contains forty-four letters. The Burmese write generally upon pieces of a peculiar kind of black paper, and with thick soapstone pencils. The priests are the teachers, and the monasteries are the national schools. Education is so widely diffused that there are few of the common people even who cannot read and write.

The greater part of Burmese literature is metrical. It consists of treatises upon theological and legal themes in the Pali dialect; legends of the different Buddhas, songs, epic poems, romances, histories; works on medicine, music and painting; and books of astrology, cosmography and astronomy in both the Pali and Burmese languages. A popular form of literature, which I often saw the school-boys reading, was a sort of religious or historical story. These usually contain a moral, and seem well adapted to the comprehension of so simple minded a people. And here I might mention, in support of Solomon's asseveration that there is no new thing under the sun, that a number of Burmese fables have been found the very same as those narrated by the great and good French fabulist, La Fontaine.

Each monastery contains a collection of books. These generally consist of bundles of strips of palm leaf. Each strip is two or three inches wide and two feet long, and the bundle is placed between two thin boards, which are either sealed or tied with a tape. The writing covers both sides, and is done with a sharp iron instrument like the classic stylus, the engraving being afterwards blackened with ink. Sometimes these books are illustrated. I have one in my possession, in which spaces are left on many of the leaves for colored figures of Buddha and for gilded ornamental patterns.

In remeasuring the 700 miles of water communication between Mandalay and Rangoon, nothing of special importance occurred. The River Irrawaddy is navigable as far as Bhamo, 300 miles above the capital, or just 1,000 miles from its mouth. Once a month a steamer traverses this entire distance. On an island in the upper

part of the river there is a Buddhist monastery, where are some large tame fish, which come to the surface of the water at the cry of "Tit-tit-tit," and are regularly fed by the monks. The species is allied to that of the dog-fish, without scales, from three to five feet in length, and apparently consisting of head and mouth. They are exceedingly voracious, and beg by the suggestive process of opening their huge jaws. They are so thoroughly domesticated as to freely permit any one to stroke them on the back.

The scenery of the Irrawaddy from Mandalay to Bhamo is very fine, the river passing through narrow mountain gorges, fertile lands, and by picturesque villages, pagodas and temples. Not far below Bhamo is an especially striking and beautiful defile about fifteen miles in length. The river here is quite narrow, while the banks on both sides rise to a height of five or six hundred feet, and are covered with grand old forests, which cast their dark shadows upon the smooth water. A huge rock — called "Monkey Castle," from the number of monkeys that hang about it — rises perpendicularly 800 feet above the surface of the river, and is a noticeable feature of this wonderful gorge. As the steamer slowly tugs along the view constantly changes. Here upon a hill-top one sees a pagoda; there upon a plain a little village, or yonder, upon the water, a few fishermen in a boat. The scene is not so much calculated to please and astonish the eye by wild sublimity and rude precipices as by graceful hills, glass-like water and soft shadows.

This part of Burmah is much the richest in mineral and vegetable productions. There are found iron, coal, tin, copper, lead, antimony, salt, and gold and silver. More than 2,000,000 dollars' worth of gold and silver alone have been dug from the mines near the frontiers of China. Sulphur, nitre, marble and amber are also found. The hills are covered with valuable teak and oak. The soil being remarkably fertile, the valleys and plains offer, with moderate cultivation, millet, maize, wheat, cotton, tobacco and the sugar-cane. In the beds of the rivulets are found the topaz, sapphire, amethyst and other gems. The famous ruby mines are about seventy miles from Mandalay. They produce the finest stones in the world. Rubies have been found weighing 150 grains, and sapphires as much as 4,000 grains.

I should like to say something of the Christian missionary work in Burmah, but fear your patience is already exhausted. Missions have been established in this country for more than 150 years. The Bible, as you probably know, was first translated into Burmese by our

revered countryman Judson, about forty years ago. He and his excellent wife were the forerunners of many energetic propagandists since sent out by the American Baptist Mission. Owing to the susceptibility and native kindness of the Burmese character, the missionaries have met with great success in their labors during the past twenty years.

Burmah has a number of harbors which are surpassed by few in the world. A railway between Rangoon and Prome, 180 miles, is now projected. Many common roads, reaching rich agricultural districts, are also laid out — the rivers heretofore being the only commercial routes. The articles of export from Burmah are raw cotton, precious minerals and stones, ornamental feathers, teak timber, terra japonica, stick lac, beeswax and ivory. Many of the rich products of our southern States, as tobacco, sugar-cane and cotton, are indigenous to Burmah.

At present, Burmah is in a strange state of transition; civilization and barbarism are most oddly mixed. Not here, as in Japan, has European imitation become the rule. Burmah is too secluded and too difficult of access. Still, much is to be expected from a country where there is scarcely a male who cannot both read and write, and where the people, possessing none of the bigotry and narrow-mindedness of the Mohammedans of India, or the Ancestral Worshipers of China, show they are not only willing but also eager to assimilate the arts and sciences of western nations. The enlightening influence of the British is incalculable. Under their rule — direct or indirect — the material prosperity of Burmah is assured. The march of improvement has already begun, and though it may be slower than in Japan, it will not for that reason be less safe and sure.

The mere fact that two of the kings of Farther India, contrary to ancient custom, left their respective countries a few years ago and traveled, the one to Java and India, and the other to Hong Kong and Pekin, is of immense significance. Even so limited a view of the outer world cannot fail to have a great influence upon the future careers of these potentates. It will more dispose their subjects to external reciprocities and internal improvements, and stir up a spirit of rivalry for equal advancement with their neighbors.

Evidently the Burmese are now seeking with eagerness what they have so long strenuously resisted — an entrance into the community of nations, a participation in the commerce of the world. The results achieved by the introduction of western enterprise and culture are curious and interesting. Canals are in contemplation; railways have

been surveyed, and the work upon them begun; steamers have long been plying on the large rivers of the kingdom; the electric telegraph has connected the principal cities since 1870; a Burmese newspaper has recently been started by the king at Mandalay, and primary and high schools are giving the training of civilization to the young receptive Burman intellect.

These and other evidences of material prosperity and anxiety for progress, one may now see in Burmah. Already the thinker foresees a rich harvest in improved government and laws, greater religious toleration, broader education, and purer morals. When the present remains of barbarism shall have been swept away, there will be erected in this isolated tropic a unique but substantial civilization — more picturesque, indeed, than those with which we are familiar, yet as full of important social problems as the civilizations of colder climes.

SURVEYS AND RECONNOISSANCES FROM 1870 TO 1875 FOR A SHIP CANAL ACROSS THE AMERICAN ISTHMUS.

By Commodore Daniel Ammen, U. S. Navy.

Washington, D. C., *October* 21, 1876.

Chief Justice Daly, LL. D., *President American Geographical Society, N. Y.*

Dear Sir. — In reply to the request of the Society for information in regard to the recent surveys which have been executed by the government of the United States for a transcontinental ship canal across the American isthmus, I very cheerfully send you the enclosed communication, placing it at the disposal of the Society. In presenting the paper relating to these surveys, a brief explanation may, however, be expected from me by at least some of your members.

More than twenty years ago I was attracted to the consideration of this subject by the then published accounts of the coincident attempts by the English, the French and ourselves, in the vicinity of Caledonia bay, to discover the pretended Cullen route — a route disproved by those three parties, but which, having been again insisted upon as feasible, was recently shown by the American expedition (1870) to be a physical impossibility, by reason of the elevation of the water-shed adjacent to and across the "divide" near Caledonia bay, the chief streams of which water-shed flow into the Pacific.

At the date referred to, the English, working from the Savanna river, ran a line of levels toward Caledonia bay, and reached the waters of the Sucubti, the stream north and west of the Caledonia. bay range of mountains, at a height sufficient to show the impracticability of the route.

The French seem to have abandoned their work without producing instrumental results indicating in any degree a hope of success.

The American party, under Lieut. Strain of the navy, ascended the mountain range from the bay, reached the Sucubti on the Pacific slope, and, without the use of instruments of precision, followed the tortuous stream to the Chucunaque, and made their way down that still more tortuous stream, with the loss of more than half of their

number by starvation. This was the natural result of not providing proper outfit, and carefully husbanding their provisions. No positive knowledge was gained by our expedition, except the necessity that future explorers should be judiciously provisioned and equipped with the means of securing the best instrumental results.

After two days' descent of the Sucubti, Strain's party, when encamped upon an island, had supposed they heard the evening gun of the "Cyane," the vessel which they had left anchored in Caledonia bay. This supposed fact, seemingly without significance to them, attracted my attention; for, if it were a fact, it would appear to indicate the existence of a low line of levels between that point and the waters of Caledonia bay. It seemed to me not at all likely that the sound was deflected up a mountain side and again descended through the valley beyond.

I was led to consider more fully the probability of a low line of levels near the point referred to, and further to study the question of meeting the formidable obstacles besetting explorers in this almost impassable region, and of securing sufficiently positive conclusive knowledge of the country to establish, in relation to all the watersheds, the practicability of a transcontinental ship canal, or the reverse.

Presenting my views, in 1856, to Mr. Toucey, then secretary of the navy, but failing to receive his countenance and support, I went to the Pacific ocean on board of one our of vessels of war, and did not return until 1860, when I wrote out briefly my project for exploring the entire region necessary to be examined, in a paper which this Society did me the honor to read on the seventh of June of that year. This project has, in fact, formed the basis of our surveys and explorations, modified as has been found necessary by the intelligent and able officers who have actually executed the work.

At the time when the paper was read to your Society, the political condition of our country was disturbed, and the years of civil war which followed, indefinitely postponed even the consideration of this most important subject. On my return from the Asiatic station in April, 1869, I was gratified at finding that appropriations had been made for transcontinental ship-canal surveys, and that General Grant, then president, was initiating a comprehensive examination and sufficient surveys of the extensive region involved. Their full execution has required years of labor, and the employment of large well-equipped parties, as will be hereafter shown.

For the past five years, during which I have been chief of the

bureau of navigation, the secretary of the navy has honored me by directing the bureau to give special attention to the selection of most efficient officers for this work; to look closely to the proper supply of articles of subsistence, and of the best instruments found by experience to be suitable; to formulate orders for his examination and approval; to examine closely the results of surveys; and to supply whatever deficiencies might be found to exist for the full investigation and determination of this question.

Since the appointment by the president of the commission to investigate and report upon a transcontinental ship canal route,* all orders and instructions for surveys in progress have been, in effect, in accordance with the wishes and requirements of that commission; at their instance a close instrumental survey and actual location of a route was made on the Isthmus of Panama, and a further examination of the Chepo-San Blas route from the Pacific coast.

The surveys were at length completed, as will be referred to in detail. They were satisfactory to the commission, and I can assure you that their execution was no holiday work. In every case where tentative lines only were prosecuted, this was done instrumentally to a point developing impracticability, or else a manifest inferiority for construction, as compared with other lines found more favorable. On the latter, actual instrumental locations for a canal were made, and plans and approximate estimates of construction prepared.

I cite, in this connection, a few paragraphs from my report to the secretary of the navy, of October 26, 1875 (Annual Report of Secretary of the Navy for the year 1875, pages 60, 61):

"The arduous work which has been carefully prosecuted for five seasons by two or more parties from the Isthmus of Tehuantepec to twenty or more miles south of the mouth of the Napipi, on the River Atrato, is at length satisfactorily accomplished.

"It is the duty of this bureau to acknowledge the ability and energy of the different officers who have been in command, and the untiring zeal and faithful and intelligent exertions of their subordinates. The precautions of those in command are shown in the fact that not one officer or man has succumbed to climatic influences, though many doubtless carried the seeds of disease and earlier death away from the field of operations. No case of bad conduct in either

* The commission appointed March 18, 1872, was ordered to consist of the chief of engineers U. S. A., the superintendent of the coast survey, and the chief of the bureau of navigation.

officer or man engaged on this work has come to the knowledge of the bureau." * * *

"By tentative surveys, following in the main up the various valleys on both coasts, until reaching heights and distances apart that would make the different water-sheds between the points named inferior to other points already known, the process of elimination was completed. It was a long, laborious process, taxing the endurance of the officers and men.

"Since my last report, at the request of the commission appointed to consider and report upon the interoceanic canal, by your order, a careful survey of the Isthmus of Panama was made, the computations completed, and the whole placed before the commission.

"A reconnoissance on the west coast was also made of the Rio Chepo and the San Blas route, where the tide-waters of the two oceans approach more nearly than at any other point. This work was executed by Commander E. P. Lull, U. S. N., and junior naval officers, aided by Civil Engineer A. G. Menocal, U. S. N.

"At the instance of Commander T. O. Selfridge, who had executed the former work on what is known as the Napipi route, the department directed the fitting out of another expedition to make an actual location of an interoceanic canal along this line.

"This work was assigned to Lieut. F. Collins and junior naval officers.

"The work has been successfully accomplished, the computations made and placed before the commission.

"So careful and minute has been the examination of the different water-sheds up to the point of manifest inferiority to other known points, that no doubt now exists as to the approximate labor necessary in the construction of an interoceanic ship canal at several points. It is proper to add, that the most careful and elaborate surveys would necessarily have to be made in advance at any point heretofore examined before commencing the construction of an interoceanic ship canal, and that these surveys could only ameliorate the labor and cost of construction, inasmuch as *the locations, as given, are actual throughout their length*, and would only be changed when an advantage would be gained by doing so."

In view of these conclusions, which I hope to establish fully with those who will re-examine the various surveys that will be hereafter summarized, I have read with some surprise the postulates recently and widely published by M. Leon Drouillet, engineer, and member of a "commission of commercial geography of Paris," lately formed

under the sanction of the French Société de Géographie — postulates on this subject thus seemingly indorsed by that learned and distinguished body.

Through the kindness of M. Drouillet, I have been favored with a copy of the proceedings of the "French Section of the International Committee for the Exploration of the American Isthmus," and also with a pamphlet, of which this gentleman is the author, elaborating a plan for such an international exploration. *

In the pamphlet referred to Mr. Drouillet, when urging the necessity of an international exploration of the American isthmus, sets out with the following postulates:

"Le problème de la Navigation inter-Océanique est actuellement insoluble par suite de l'insuffisance des données géographiques et des contradictions flagrantes qui existent dans ces données; insuffisance et contradictions qui ne permettent point à l'ingénieur l'étude approfondie d'un projet définitif."

["The problem of interoceanic navigation is, at present, incapable of solution on account of the insufficiency of geographical data, and of the flagrant contradictions which exist in these data — an insufficiency and contradictions which do not permit the engineer to study profoundly a definite project."]

On the strength of these assertions, with the seeming approval of the Geographical Society of Paris, an appeal is made to the learned societies of the world, and to all the powers interested, to lend their aid to a "general and serious exploration of the isthmus."

In view, therefore, of the long series of elaborate explorations and reconnoissances lately made by the United States, reported upon by the commission to the president, and *accepted as satisfactory by him* it seems proper to present what has been really done by us, and to leave to the good judgment of those societies and interested powers, whatever action seems to them necessary or advisable.

The demand for a resurvey is rested upon two principal grounds:

1st. That the data at hand are insufficient.

* "Société de Géographie et Commission de Géographie Commerciale de Paris, Section Française du Comité International d'étude pour l'éxploration de l'Isthme Américain en vue du percement d'un Canal inter-Océanique.

"Procès verbal de la séance du 11 Mai, 1876."

"Les Isthmes Américain — Projet d'une exploration Géographique Internationale des terrains qui semblent présenter le plus de facilités pour le Percement d'un Canal Maritime inter-Océanique. Par. M. Léon Drouillet, Ingénieur, Membre de la Société de Géographie et de la Commission de Géographie Commerciale de Paris."

2d. That what information is available is flagrantly contradictory.

Let us consider these two assertions separately.

As for the sufficiency of the data at hand, without, at present, going beyond the work executed for the most part during the past six years by the United States alone, we may point to the following not inconsiderable sources of reliable information respecting every part of the isthmus, of any promise for a canal, from Tehuantepec to the Napipi river in South America.

Of our survey and reconnoissances the following is a list in the geographical order from the north and west to the south and east, in regard to which list it is to be specially noted that every survey and reconnoissance was made with instruments of precision, unless mention to the contrary is herein made.

All lines upon which calculations have been founded were run by compass and chain, or transit and chain, or by gradienter and stadia-rod, the barometer being relied upon only to fill in the topography on either side of the main line.

1. Instrumental reconnoissance of the Isthmus of Tehuantepec, by Captain R. W. Shufeldt, U. S. N., 1872.

2. Examination, survey, and definite instrumental location of interoceanic canal route from the vicinity of Greytown, *via* Lake Nicaragua, and thence *via* the Rios del Medio and Grande to Brito, by Commander E. P. Lull, U S. N., 1872, 1873, with some preliminary operations by Commander Chester Hatfield, U. S. N., in 1872.

3. Examination, survey and definite instrumental location of an interoceanic canal route from Navy bay to Panama, by Commander E. P. Lull, U. S. N., 1875.

4. Examination and surveys from the Gulf of San Blas towards the River Chepo, by Commander T. O. Selfridge, U. S. N., 1870; and Reconnoissance from the waters of the Chepo towards the Gulf of San Blas, by Commander E. P. Lull, U. S. N., 1875.

5. Several tentative instrumental lines in the vicinity of Caledonia bay, across the Cordilleras to the waters of Sucubti and Morti rivers, tributaries to the Chucunaque, by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871.

6. A barometrical reconnoissance of the so-called "De Puydt route," by way of the Tanela river between the Tuyra and the Atrato, by a party under the direction of Commander T. O. Selfridge, U. S. N., 1871.

7. Tentative instrumental lines by the so-called "Gogorza route," from the eastern coast *via* the Atrato, Cacarica and Peranchita rivers,

and from the west coasts, *via* the Tuyra and Cué rivers across the "divide," by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871.

8. An instrumental examination of what is known as the "Truando route," by Lieuts. Michler, U. S. A., and Craven, U. S. N., 1856–57.

9. An instrumental reconnoissance of the Napipi and Cuia rivers, including a reconnoissance of the Atrato river to the town of Quibdó, by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871 and 1873.

10. Tentative examinations and definite instrumental location of an interoceanic canal route by way of the Napipi and Dogundo rivers, by Lieut. Frederick Collins, U. S. N., 1875.

The results of these several explorations will now be briefly noted in the same order:

1. *Tehuantepec.* — *Indisputably inferior to other known points.* Number of locks required, 140. Length of canalization, 144 miles.

2. *Nicaragua.* — A summit of 107.6 feet; length of canal requiring excavation, 61.75 English miles; slack-water navigation by means of dams in the bed of the San Juan river, from the mouth of the San Carlos to Lake Nicaragua, a distance of sixty-three miles. Lake navigation for 56.5 miles to Virgin bay; and thence, *via* the valleys of the Rio del Medio and Rio Grande to Brito.

This plan involves the construction of four dams having an average hight of 29.5 feet, and an aggregate length of one thousand three hundred and twenty (1,320) yards; and of twenty locks of an average lift of ten and twenty-eight hundredths (10.28) feet each. It also involves the construction of two harbors of sufficient extent to insure, at least, a smooth and safe entrance into and exit from the canal.

It is worth remarking that M. Drouillet, in presenting the fifteen projects in this vicinity, does not distinctly describe this route (projected after a careful instrumental survey, involving several tentative lines from Lake Nicaragua to the Pacific); nor would a reader of the pamphlet referred to, assign this line as above presented, to any one of the fifteen projects given in it. This leads to the supposition that he has given the preference to some of the less exact surveys or supposititious pretensions quoted as examined; and this belief is entirely verified by the fact that he gives the actual height of Lake Nicaragua above the sea level as thirty-seven metres, which is thirteen and six-tenths (13.6) English feet in excess of the true elevation (as presented by our careful instrumental surveys) — in excess even of the elevation

to which the mean elevation of the surface of the lake is to be raised and maintained by a dam.

3. *Panama.* — This survey, executed as has been said, at the request of the commission appointed by the president to investigate the whole question of a ship canal, made an actual location along an entire route. Maps, plans and estimates for excavation and construction have been carefully prepared, as upon the Nicaragua route, and on a common basis of cost for like labor. The report of the survey published in the appendix to the report of the secretary of the navy for 1875, does not appear to have been in M. Drouillet's possession.

4. *San Blas.* — The surveys of Commander Selfridge from the east coast, and those of Commander Lull, from the western, demonstrated that there is no practicable route between the Gulf of San Blas and the waters of the Chepo, even with a tunnel of eight (8) miles, although between these points the tides approach each other from the two oceans more nearly than elsewhere.

5. *Caledonia Bay.* — The tentative instrumental lines from the northern and southern parts of Caledonia bay across the "*divide*" to the elevated beds of the Morti and Sucubti rivers, showed, for the second time, that the information of Edward Cullen was an invention.

The line from the southern extremity of Caledonia bay crossed the "*divide*" at an elevation of twelve hundred and fifty-nine (1,259) feet, and struck the bed of the Sucubti at a height of five hundred and fifty-three (553) feet, thus precluding the possibility of any pass under that altitude above the point reached on the Sucubti.

The line from the northern extremity of the bay up the valley of the Sassardi and across the "*divide*" to the Morti, crossed at an altitude of eleven hundred and forty-eight (1,148) feet, and no indications of any pass under one thousand (1,000) feet could be discovered.

This line is marked by M. Drouillet for re-examination.

6. *De Puydt's Route.* — The exact line advocated by De Puydt, as obtained from a gentleman who had accompanied him, was followed for some thirty-three (33) miles. At this distance an elevation of six hundred and thirty-eight (638) feet had been reached, while the mountains of the divide were plainly visible beyond. Three mercurial mountain barometers were used; one at the sea level was observed at short intervals during the whole reconnoissance, the other two were carried by the party; bench marks were established at convenient distances, one barometer remaining at each bench until another had reached the next, and until sets of different observations had been obtained.

7. *The Atrato-Tuyra Route.* — The tentative instrumental lines from the east and the west coasts, which were run in the examination of this supposed route, established the fact that Hellert, La Charme and Gogorza were pretenders — were it indeed necessary to establish this in the case of those who have done no more than make unsupported assertions. Our regular line of survey — by way of the Atrato and Peranchita rivers on the east, and the Tuyra and Cuè rivers on the west — crossed the "divide" at an altitude of 712 feet; while a little further north, Captain Selfridge crossed at a height of 400 feet, as estimated from rough observations with his pocket aneroid.

M. de Gogorza claims that Captain Selfridge's examinations did not cover his proposed route; but it will always be possible for him, and other authors of brilliant but vague projects, to make this complaint regarding any expedition not led by themselves. Whether the exact route proposed by M. Gogorza was followed in this case or not, it is certain that the explorations were sufficiently extensive to show that the whole country, on the Pacific side of the divide especially, is a net-work of high hills, which feature, taken in connection with the extensive swamps on the Atlantic side, is sufficient to condemn the route, independently of the height of the dividing ridge.*

(This locality, with two preceding ones, involving also the region of a third, comprises points specially noted by M. Drouillet for examination; he thus entirely ignores the joint attempt by the English, the French and ourselves, on the latter route in 1854, and the recent instrumental disprovement of it, with the others, *by us.*)

* Since writing this paper, the pamphlet and map very recently published in Paris by M. de Gogorza have come into my possession. In this pamphlet — "Canal Interoceanique sans écluses ni Tunnels" (!) — M. Gogorza asserts that Commander Selfridge's surveys support his own, so far as they were made over the same ground. This is an ERROR. Commander Selfridge gives the height of the mouth of the river Paya at one hundred and forty-four (144) feet, and the height of Paya village at two hundred and fifty (250) feet. M. Gogorza gives the same height for the mouth of the Paya, but is silent as to the heights in ascending to the village of Paya, twenty miles above, following the sinuosities of the stream, and does *not give the height of that village at all.* He contents himself with asserting that, at a distance of miles beyond the village, at the summit level, the height is only fifty-eight metres (58), one hundred and ninety feet; that is to say, *sixty feet below the village!*

The altitude of the mouth of the Paya river itself, as given by himself, and on better authority, contradicts flatly his assertion that a ship canal, without locks or tunnels, can be located between the summit level, the village of Paya, and the mouth of the Paya river. He terminates his canal at the Isla de Lagortos, but does not locate that significant island.

9 and 10. *The Atrato-Napipi Route.* — This was examined first by parties under the direction of Commander Selfridge, and afterwards by Lieutenant Collins. By the last named officer a definite instrumental location for a canal was made; the question of additional water supply from the Cuia was investigated, and calculations for excavation and construction framed on a common basis, for like labor as for Nicaragua and Panama. The report of his survey, without maps and plans, is to be found in the appendix to the report of the Secretary of the Navy for 1875. The lack of appropriation for publishing this report, and that made by Commander Lull on Panama, *in full*, is regretted.

These surveys are not named by M. Drouillet in his list of authorities.

These repeated and laborious surveys certainly indicate the continued interest which the United States has taken in the construction of a canal. This interest dates back, indeed, to the administration of Mr. Jefferson, and its appreciation by the Congress of the United States was shown as early as 1835, by an elaborate report in the House of Representatives; as subsequently by various official inquiries and American treaties. (See Report No. 145, Ho. Rep., 30th Congress, 2d session *et al.*)

If necessary, not a few other American authorities might be cited, such as those of Trautwine, Kennish, Porter, Totten and Childs, employed by private American enterprise, as affording reliable information within the limits claimed; but it would appear that the sufficiency of the data is already manifest, provided the authenticity is unquestioned; and this brings me to the second postulate of M. Drouillet, that "the data at hand are flagrantly contradictory."

But here I repeat that our surveys have been pursued for several years by officers of well established reputation and ability, aided by full and competent scientific staffs, with every advantage of outfit, of instruments and stores; and, in the latter surveys, with the additional advantage of the experience possessed by the principal officers — an experience to be acquired only in the field.

The scientific staff of the first expedition of Commander Selfridge numbered thirty-five members, including astronomers, geologists, mineralogists, topographical and hydrographical engineers, telegraphers, photographers, and others. The men attached to this expedition, exclusive of natives employed as laborers, numbered about 300. Three ships of war were also attached to the survey — two on the Atlantic side and one on the Pacific side.

The scientific staff of the second expedition of Commander Selfridge numbered thirty (30) members, exclusive of the officers of the U. S. S. Nipsic and Resaca, both of which, with the U. S. S. Guard, were attached to the expedition.

The Tehuantepec and Nicaragua expeditions were equipped with like liberality.

Able officers of the United States coast survey and civil engineers were associated with the commanding officers in these various expeditions, notably Messrs. Sullivan, Mosman, Ogden, Merinden, and Blake, all of them distinguished coast survey officers, trained in the severely correct methods of that service, were with Commander Selfridge; A. G. Menocal, civil engineer, U. S. N., was with Commander Lull; and A. M. Fuertes, civil engineer, with Captain Shufeldt. Commander Lull and Lieutenant Collins had served with Commander Selfridge in the earlier expeditions in Darien, and many of the officers subsequently associated with them had also seen service in the same way.

The work assigned to the expeditions thus equipped was laid out by careful and ample instructions from the navy department, and was satisfactorily performed; the results obtained are believed to be all that the nature of the conditions rendered possible.

None of these extended surveys conflict in any degree with each other or with other partial surveys or reconnoissances which have been at times undertaken by private American enterprise. If any authentic instrumental or proper tentative lines in the possession of M. Drouillet disprove or contradict any one of our surveys, this would certainly be of profound interest to the learned societies of the world, and afford for them foundation for further projects of exploration, however little they are considered necessary by those who have gone through these repeated practical labors and experiences in the gloomy fastnesses of the great American isthmus. Until, however, such *authentic* contradictory data can be shown, it must appear that the "flagrant contradictions" asserted to exist, arise from a want of placing merited confidence in the surveys of the United States. If the unsupported statements of men who discover the proper site for an interoceanic canal by "observing the flight of low-flying Pisisi ducks," or who obtain their altitudes "by the velocity of mountain streams," or the boiling point of water merely; or who are confident of a continuous depression from the mere aspect of the forests, as seen from on board ship, or from having observed an "inclination of the ground to be scarcely perceptible;" if these deceptive appearances,

so well recognized by travelers, some of which were strongly noted in this very connection by Humboldt when describing his ascent from Callao, are to be placed alongside of official government surveys, then certainly "the flagrant contradictions" must be expected, and will certainly exist, if even the new, general and "*serious*" survey now claimed to be necessary is undertaken and completed.

The deceptive appearance of the mountain ranges from the sea, which has misled so many, was thus noted by Lieutenant Michler, U. S. A., in his report of 1856–'57: "In looking back from the ocean upon the country through which the travelers had recently passed, the depression in the Cordilleras becomes plainly visible. It seems to lose its mountainous character entirely. * * * One can easily, therefore, conceive why a preference should have been shown to this section by those interested in the construction of a canal." And the common experience of our officers on the isthmus has been, that wherever a line of low elevation has been affirmed to exist on the strength of the authority of "old Spanish maps or documents," or on the information of "intelligent persons residing in the vicinity," or "through conversations with the natives"—*there* an elevated, forbidding range of mountains or hills has been found.

Our surveys have been undertaken and conducted with a view to ascertain the relative practicability of all possible canal routes. It is not affirmed that they are sufficiently extensive and minute at all points to afford the engineer full data for locating a canal, and for estimating its approximate cost. Actual instrumental locations of determinate lines throughout were made at three points only — at Nicaragua, Panama, and the Napipi. The tentative lines in other places were carried only sufficiently far to demonstrate the impracticability or manifest relative inferiority; thus eliminating, however, all such territory from the canal problem.

If it is in the plan of M. Drouillet, or of others, to procure the precise data called for by the engineer on each of the pretended, or of the real lines of promise for a canal, there will certainly be need by such parties of the most extensive co-operation in every particular which is invited in the publication referred to.

The natural conditions of the American isthmus will be found widely different from those of Suez, to which constant reference is made. One is a region of extraordinary rainfall — the other of extreme dryness; the one covered with impenetrable and interminable forests — the other wholly denuded; the one a region of steep escarpments and watersheds, where every ravine, many times during the year, becomes a river of rapid waters, rushing wildly to the sea,

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and bearing huge masses of silt, giant bowlders and fallen trees—the other simply a sandy, level plain. If the existence of any narrow American valley, many miles in length, between the seas, *be* admitted, and a canal without locks be supposed to be located therein, *it must become the ultimate drainage of that whole tropical valley.* By what human power could it be kept clear of the debris swept into it by every heavy rainfall along its entire length?

Let such low valleys, however, continue to be pointed out "for a canal without lock or tunnel," as by M. De Puydt, M. Gogorza, or by whomsoever can hold forth the most brilliant promise; let further search be made by whomsoever feels interested, hopeful and credulous; and let the work go on, aided by such forces, governmental or otherwise, as may be furnished; the United States and its learned societies may properly decline co-operation. The question whether the authorities I have quoted are sufficient to determine the location of a transcontinental ship canal is an open one; those who think the authority insufficient, may well proceed with whatever surveys they may deem necessary.

In submitting what has been done by learned societies, no indulgence for nationality is desired; nor, on the other hand, can there be a tenable assumption that we are incapable of obtaining results which can be obtained by others, or that we have not the integrity to present them fairly. Surveys tell their own story, and discredit themselves if they are to be discredited. I feel sure that this learned body would not willingly discourage others in the prosecution of further surveys, however unnecessary the society may consider them, and however unwilling, therefore, itself to participate in them.

In Paris, in August, 1875, it was urged by persons who may, perhaps, be properly styled adventurers, attending the International Geographical Congress, that the government of the United States had really shown no interest in the subject of a transcontinental American canal, and that our information and surveys amounted to but little. The misapprehension on the first of these points, if it exists, is too apparent to require contradiction; the assumption of the second seems the result of not having examined what the United States have done, or it is the affectation of a belief that we cannot do the work as well as any other people.

So far from the United States being indifferent to the construction of an interoceanic canal, for more than fifty years,* as has been

* See correspondence between Mr. Clay and our chargè, Mr. Williams, and Mr. Canaza, Minister of the Centre, in April, 1825.

shown, we have endeavored to establish the practicability of the work at the most favorable point; and I venture nothing in asserting that our government will be anxious to do whatever is proper to aid in the construction of the work on the broadest principles of common benefit to all nations and peoples.

It is asserted that Great Britain would oppose it, under the supposition of its injury to the Suez canal, in which she has now a pecuniary interest. But when by reference to the map it is seen how readily an American ship canal will bring her into communication with the eastern coast of Australia and New Zealand, relieving her outward-bound voyagers of head winds, it is safe to assert that such advantage, with others, would exceed in value yearly her whole interest in the Suez canal.

The American transcontinental canal will bring Great Britain within easy commercial relations with the entire west coast of America, exchanging the stormy passage around Cape Horn, with head winds, for a short American route with fair winds and good weather; it will make the products of British Columbia and of Central America (where British trade is even now so important) doubly valuable; and it will bring the wheat products of California more fully and competitively into British markets — thus cheapening and making less fluctuating the price of bread-stuffs, an incalculable advantage for the masses of a manufacturing and commercial country.

And while this is true, it is equally demonstrable, by an inspection of the world map, that the great lines of commercial intercourse and of civilization are distinct, and therefore do not invite any prejudicial rivalry between the two ship canals of the Eastern and the Western isthmuses. The Suez canal is the opened gate for the inland sea route of Europe and North Africa, with southern Asia and its archipelago; the American Isthmus canal invites Europe with our own commerce to the whole west coast of the Americas, to northern China and Japan, and southwardly to the Australian continent. Nor can commerce longer forget that not only the drainage of the rivers emptying into the American Mediterranean is of an area greater than that of all the rivers emptying from Europe into the Atlantic, and of all those emptying into the Mediterranean and into the Indian ocean, but that the valleys of these American rivers are those of different productive zones. The back country essential to commerce exists here, therefore (as Maury showed twenty-five years ago), around the Mexican gulf and the Carribean sea, to a larger extent than that around any other sea.

It is said that the overland railroad interests will oppose the construction of a transcontinental ship canal. This will certainly not be the case if they study their own advantage.

This year the wheat crop of California for export alone is stated to be in excess of twenty millions (20,000,000) of sacks of 100 pounds each, *none of which can be sent to the eastern coast by railroad without a commercial loss.*

The undoubted advantage to a railroad is to favor the most economic means of transport of this great product, and of other gross and valuable products not transported by rail. For by thus promoting their increase (needed for the supply of Europe and of own eastern coast) the railroad must surely gain a recompense through the travel consequent upon an increased and healthy population on the Pacific coast, and the transportation of the light and valuable freights that would of necessity then exist to meet their wants. It requires but small comprehension of the situation to appreciate the fact that the construction of a transcontinental canal would build up instead of injuring railroad interests between the two oceans.

By our geographical position and relative proximity to the isthmus and the countries beyond, we have a greater interest than any European power in the construction of this great work. The commerce of the whole world, however, has large interest in it, and, therefore, the cost of its construction and its profits, as well as other consequent advantages, seem common to all. This necessarily involves a broad neutrality for the canal and its approaches — a neutrality to be supported either passively or actively, as the nations may best exert their forces.

The correction of misconceptions on this whole subject, and the apparent advantage of stating, at this time, definitely its true condition, has been the object of this paper. In common with many others, I have looked for many years with much interest, to the development of this problem in a commercial view, which, in fact, involves its realization. No doubt exists now of this commercial practicability. I may add, as a personal conviction, that however long and seriously the search may be continued for "results" by surveys, nothing can be or will be developed so advantageous as that which the surveys of our government present for your consideration.

I am very respectfully yours,

DANIEL AMMEN,

Commodore U. S. Navy and Chief of Bureau of Navigation.

Col. T. Bailey Myers, at the conclusion of the reading, said:

"This subject having been again brought up by French geographers, and attention having been called to the work which has been done by officers of our own navy, under the direction of the government, on the various routes examined in searching for the most feasible for an isthmus canal, Commodore Ammen, as chief of the bureau charged with this duty, possessed of the official statistics, has given us a brief but full statement of these valuable preliminary explorations, made by selected and competent officers, leaving, as to those routes, no grounds for conjecture, but reducing their work to intelligible charts, supported by such corroborative evidence of accuracy as were considered valuable to those who undertake the enterprise, fairly open to the examination and suggestions of other engineers, based upon some, if not similar facilities of observation, and also to the competition of more practicable routes, if possible, discovered by other nations or our own.

I move that the thanks of this Society be tendered Commodore Ammen for the paper he has so kindly prepared, and that it be printed in the Journal of the Society."

The motion was carried unanimously.

PALESTINE EXPLORATION BEYOND THE JORDAN.

By Rev. R. D. Hitchcock, D. D.

MEETING OF SOCIETY, CHICKERING HALL, OCTOBER 31, 1876.

Of all lands on the face of the globe there is none towards which so many eyes are constantly turned as towards the land of Palestine. It was the cradle of Judaism, the cradle of Christianity, and in its immediate neighborhood was the cradle of Mohammedanism. No such history was ever anywhere worked out as in that land. Ancient Greece was, indeed, a little country with a great history; but Palestine is less than half as large, being hardly more than 150 miles from north to south and about ninety from east to west. Its area is less than 13,000 square miles, divided into nearly equal portions by that most wonderful of rivers which begins its course some 2,200 feet above the level of the Mediterranean and ends it some 1,300 feet below that level. It lay between great kingdoms threatening to crush it, but lay apart. Its northern gate is pillared by Lebanon and Anti-Lebanon. East and south the desert separates it from the Euphrates and Egypt. On the west it is washed and guarded by a sea that knows no really good harbor on all the coast. Within these boundaries, from Dan to Beersheba, from Salcah to Carmel, are almost all the climates and almost all the productions of the globe. On Hermon the snow is never gone; at Jericho it never stays. The stout cedar stands in sight of the feathery palm; wheat and barley, figs and olives are equally at home.

Millions of men, five or six millions, perhaps, once lived there planting trees, terracing the hills, husbanding the winter rains and gathering liberal harvests, now made impossible only by the scorching curse of a bad government. The present population is less than one-tenth of what it then was, of what it might again be. On the west side of the Jordan there may be, perhaps, a population of 250,000; on the east side hardly 100,000, if we except the four tribes of nomadic Aenezeh, some 300,000 in all, who came out of Yemen early in the second century, and since that time have been launching themselves every summer northward into Syria and every winter

southward into Arabia. The permanent tribes beyond the Jordan are the Adwan, north of the Arnon; the Beni Sakhr, south of the Arnon; and the Ghawarineh, in the Jordan Valley. Since the dreadful massacre of 1860 many Druzes have also moved in there.

But the great charm of the country is in its historic associations. Hamitic tribes, Abraham out of Mesopotamia, Moses out of Egypt, David, Solomon, Zerubbabel, the Maccabees, the Herods, Christ and his apostles, Greeks, Romans, Persians, have all been there; and the country is full of ruins and inscriptions, especially beyond the Jordan, where the people dwell mostly in tents and have no occasion to spoil the remains of ancient temples and theaters.

I need not argue the importance of exploring such a country; nor need I remind you of what was accomplished by the early travelers; still less need I boast of what has been accomplished by our own countrymen, by such men as Barclay, Thomson, Lynch and Robinson, the last of whom has done more for the geography of Palestine than any other one man that ever lived.

But the time had come for much more thorough work than had as yet been attempted. This was keenly felt by the scholars who assisted in editing Smith's *Bible Dictionary* in 1863. Accordingly, in 1865, a society was organized in England called "The Palestine Exploration Fund" for the systematic investigation of the archæology, topography, geology, geography and manners and customs of the Holy Land. Since 1871 a party of royal engineers have been triangulating the country west of the Jordan. Four months more of triangulation will complete their work in the field. In due time we shall have a map worth immeasurably more than its cost, great as the cost has been.

In 1870 the American "Palestine Exploration Society" was organized to co-operate with the English society. The Jordan was proposed and accepted as a boundary between the two societies, the English continuing the work begun by them on the west side of the river and we undertaking the east side. In 1873, Lieutenant Steever triangulated between five and six hundred square miles just east of Jericho, including Nebo and Pisgah, which were satisfactorily identified by Prof. Paine. In 1875 another party, under Col. Lane, spent about two months in the field making a rapid reconnoissance survey of nearly the whole territory. Dr. Selah Merrill, the archæologist of this second expedition, is still in Syria prosecuting the work he was sent to do, and needing only more generous remittances to enable him to accomplish still greater results.

The pictures we are now to show you were taken by Dumas, of Beirut, the photographer under Col. Lane. I am sure they will be a great surprise to you. You will see the architecture of at least three peoples and three epochs, Phœnician, Græco-Roman and Persian. Mr. William H. Goodyear, the artist, has kindly consented to explain seventeen of these pictures which are of special interest to artists and architects. In the absence of Dr. Howard Crosby, prevented from being here by illness, Dr. William H. Thomson will explain the ten or a dozen that illustrate the neighborhood of Hermon. And then, if time and your patience permit, I will take in charge what ones may be left.

RUINS EAST OF THE JORDAN.

Remarks of Mr. Wm. H. Goodyear.

Mr. Wm. H. Goodyear, being introduced, said:

"The views which I shall describe are few in number, and are selected entirely from the East Jordan views of the society, which are by far the larger proportion. And I wish to call your attention for a moment to the novelty of the views — to the fact that not one traveler in five thousand visits the country in which these ruins are to be seen. The location of these ruins is entirely north, with one exception, of a parallel drawn along the north end of the Dead Sea from Jerusalem. The single exception is the ruin of the palace at Mashita."

Mr. Goodyear proceeded to discuss the beauties and defects of the various styles of architecture displayed in the ruins, the pictures of which were thrown upon the screen.

"The first epoch of Syrian architecture," he said, "had a mixed Assyrian and Egyptian character, of Phœnician workmanship, but mere workmanship, since the Phœnicians had no independent art. The monuments of this period, as of all others, have disappeared in Western Syria, with the exception of four or five, described by Renan, lying near the coast in the north. The Phœnician temple architecture must have been also, to a large extent, without artistic pretensions, as in the shapeless Sardinian remains, or perishable, made of mud bricks, like the temple found by Cesnola on Cyprus. The remains at Arak el Emir, although dating from the second cen-

tury before Christ, will indicate in part the characteristics of this earlier period. 'The Giant Cities of Bashan,' which belong to it, in part at least, have no decorative architectural character.

"After 330 B. C., with the Greek governments of the East, the architecture until the end of the Roman period has one general characteristic — the employment of the Greek colonnade. With the Greeks the colonnade is actual; with the Romans merely a sham; but the decorative characteristics are, in either case, the same, for the Corinthian, Ionic and Doric orders are taken by the Romans from the Greek. The Romans, however, use the arch for structure, excepting in the temple, which is a copy of the Greek.

"The third period — the Byzantine — returns to wall surface without colonnade, either real or pretended; but decorates it with surface carvings. The only remaining examples of surface decorations are a palace at Mashita, and a building on the hill above Amman.

"The enormous preponderance of ruins of the Greco-Roman period will be explained by the fact that in the close of the second and beginning of the third century after Christ, the Syrian provinces controlled the policy of the empire — gave it emperors, and attained their highest prosperity. The building activity would replace earlier monuments by others representing the taste of the time; as, for instance, in Jerash every building belongs to one period. As regards the monuments in the Hauran, it is probable from the delicacy of feeling manifested in many cases that the buildings belong to the era of the Greek rule before Christ, or before the Greek taste had suffered much decadence.

"The East Jordan monuments show forms of decadence unknown to other portions of the empire, even in the same epoch; for instance, raised bases, projections on the shafts of the columns, excessive niche decorations and a combination of the architrave and arch. At the same time, most remarkable examples of fine architectural feeling and good decorative work exist, showing the continued ascendency of the Greek feeling, which finally, in the Byzantine period, succeeded in forming out of the ruins of antiquity, in the early Christian style, one of entire originality and beauty."

SYRIAN RUINS.

Remarks of Prof. Wm. H. Thomson, M. D.

Professor Wm. H. Thomson, M. D., was next introduced. He explained a number of pictures thrown upon the screen, and commented upon them in an instructive and interesting manner. While a resident of Syria, he said, he had frequent occasion to know how the disappearance of the most celebrated cities of antiquity had been brought about. He had seen the workmen quarrying amid the ruins of the once flourishing port of Beyrout. While they were digging for stone, he had seen them one day uncover a private passage in an ancient wall, from whose shot-holes doubtless many of Alexander the Great's soldiers were killed. Within a few months that fine passageway had been entirely removed, and its great stones broken up. In a similar manner the mighty foundations of the temple of Hercules were removed in the following year.

The visitor to the ruins of Gerasa would learn that the remaining walls had been constructed largely of Phœnician stones brought from the ruins of the great city Athleet. In this way, even in ancient times, cities were constructed out of the remains of their predecessors all along the shores of the Mediterranean where the stone could be transported by sea. In the East Jordan country, however, owing to the rugged nature of the region, it had never been possible to carry on this process upon a large scale, and hence the ruins of that district remained almost intact from century to century, and resulted in leaving that region more replete with buildings erected in its flourishing periods than any other district of equal area in the world.

Referring to a picture of the cedars of Lebanon, Dr. Thomson said that these are almost as great a curiosity as Lebanon itself. From very early times Lebanon was despoiled of its cedar groves by surrounding nations, so that we now find by the Ninevite inscriptions that the Syrian monarchs transported cedars for their palaces on the Tigris. At present there are only ten cedar groves on Mount Lebanon besides that at Barak.

The Jordan river does not, Professor Thomson said, owe its perennial volume of water to the direct influx of the winter rains, but rather to the melting of the snows on Mount Hermon which feed the vast fountain at its base, so that the Jordan is fullest two months after the rainy season has ceased. The French writer, Volney, by

whom the accuracy of the statements in the Book of Joshua, that the Jordan overflows its banks in barley harvest, that is in April, was questioned, made a great mistake when he stated that the Jordan was filled by the rains of January and February, and rapidly diminished after they ceased. This objection proved that he had never visited the Jordan in April, for it is only after its great fountains are swollen by the melting of the mountain snows, and have overflowed largely into Lake Tiberius, that the river bed becomes most filled.

DISCUSSION UPON A PROPOSED INTEROCEANIC CANAL THROUGH NICARAGUA.

THE MEETING OF NOVEMBER 29, 1876.

Colonel T. Bailey Myers, in taking the chair, said:

LADIES AND GENTLEMEN.— In assuming again, under instructions, the chair of the Society, it affords me pleasure to welcome you to the first of a series of informal meetings, which will be hereafter held at stated times in our new home, for the consideration of subjects of geographical interest; and I regret that Chief Justice Daly is still prevented by illness from being present and giving you his views as to the introduction of this new feature in our organization.

The gentleman who will first address you has already, although young, served his country for several years in Europe. The subject on which he will speak is to his countrymen one of local importance, with the details of which he has become familiar. His residence here has been short, but in Paris and Geneva he had already associated himself with sister societies; and a familiarity which I have discovered in him with the minutest details of our own early history and the characters of our public men, which would be remarkable even in one of our young countrymen, seems an assurance of the great reliability as to the details of the proposed interoceanic communication long projected so near to his home. He will make a few remarks only, preliminary to a paper which he proposes to offer to the Society hereafter, more fully considering the historical, geographical, political and economical features of the undertaking.

I have the pleasure to present to you Senor Manuel M. Peralta, Minister Resident of Costa Rica.

REMARKS OF SENOR MANUEL M. PERALTA.

LADIES AND GENTLEMEN. — You know that all the maritime powers are more or less deeply interested in the opening of an interoceanic canal through the Isthmus of Central America, and that governments as well as private companies have made explorations in the different parts which seemed most favorable to the realization of this great enterprise.

Thus, the Isthmus of Tehuantepec, the Isthmus of Nicaragua (between the Lake of Nicaragua and the Pacific), and the Isthmus of Darien have been, on many occasions and by various routes, frequently surveyed — sometimes by private companies, sometimes under the auspices of the different interested governments.

It seems to me unnecessary to say, in this place, that of all these undertakings, the ones which the scientific world has considered as the most complete, the most intelligently and conscientiously conducted — in fact, the only ones which deserve public confidence — are those which have been made by order of the government of the United States, and with which you have been made acquainted by the excellent report of my honorable friend Commodore Ammen.

The government of the United States, taking into consideration the numerous surveys that have been made by its own officers and by other parties, and in order to avoid differences of opinion on this matter, thought it right to organize a commission of engineers, and other eminent men of science, to study and examine these surveys with that scrupulous diligence and impartiality peculiar to scientific men, and which are required by the very high interests at stake.

The honorable secretary of the navy, in his annual report of 1875, says to the president of the United States that the Washington commission, after the most careful examination of all the different surveys, came to the unanimous conclusion that the one known as the Nicaraguan route, beginning at Graytown (at the mouth of the San Juan river), or near that point, on the Atlantic coast, and ending in the northern bank of the Rio del Brito, on the Pacific coast, offers the most advantages and presents less difficulties than any other known route across the isthmus.

This conclusion, adds the honorable secretary of the navy, commands the highest respect, considering the character of the commission and the work accomplished by them.

In corroboration of the above, allow me to quote the words which the president of the United States addressed to me in March last:

"The relations of all maritime powers, and especially of this country, with yours, are of particular interest at this juncture, from the impression destined, as I believe, to become general, that the canal between the two oceans must, in part at least, pass through the territories of Costa Rica."

All doubts on scientific grounds, as regards the well-deserved preference of the Nicaraguan route, having been cleared away, the

question of the canal leaves the sphere of speculation and conjecture, so to speak, and enters upon that of practical action.

The present time is one of transition, or, I should be more exact in saying, a period of action preliminary to the execution of this gigantic work.

To assure the future of the enterprise it is necessary to find means for its execution and to surround it with all the protection and guaranty which the interests of commerce and civilization demand.

A great public work like this canal, whose owners and customers will be the civilized world, ought to be neutral. This was already stipulated by the Clayton-Bulwer treaty of 1850 between the United States and Great Britain, and it can be asserted that the other maritime powers receive with pleasure and are disposed to recognize the neutrality of the interoceanic canal.

Of course those most interested in this neutrality, as well as in the execution of the work, are the States of Costa Rica and Nicaragua, through whose territories passes the route adopted by the scientific commission of Washington.

The governments of these two republics have always manifested their anxiety to promote any enterprise tending to extend to their people, to all America, and, in a word, to the commerce of the world, a work of such conceded importance to all, and they may be relied upon not to omit any action necessary on their part to assure its completion.

The republic of Costa Rica extending along the border of the contemplated canal is willing to recognize and to maintain the neutrality of the canal, and to extend that privilege to any territory necessary to its use or protection lying within its sovereignty.

Any enterprise which obtains the support of the maritime powers and that of her sister state, Nicaragua, will be accepted and supported by Costa Rica, because the interests of our country and the aspirations of our government are those of civilization and progressive humanity.

I wish to express to you my gratitude for the opportunity you afford me of uniting in the consideration of this important project with the members of a Society the reputation and usefulness of which I became familiar with while engaged in my duties, and in associations with scientific societies in Europe whom I have found to rely upon your national explorations.

Mr. Jas. T. Gardner then said:

Mr. Chairman, in moving a vote of thanks to Senor Peralta for his very valuable communication I would call attention to its peculiar importance as indicating progress in the solution of the American Isthmus canal problem.

Before private capital can venture to embark in the great enterprise of building this ship canal two preliminary points must be determined: First, all possible routes have to be examined, the relative advantages of each clearly understood, and the best one selected by competent judges. Our government has spent many years and much money in exploring the various lines by which it was thought canals might easily cross the isthmus. A commission consisting of the chief of the bureau of navigation, the chief of engineers of the army and the superintendent of the United States coast survey was constituted to consider the results of these surveys and they have reported in favor of the Costa Rica and Nicaragua route. The facts upon which their opinion is based are summarized in the valuable paper of Commodore Ammen, read before this Society. This first, and in some respects most difficult, question may therefore be considered as settled, or nearly so.

The second point is to determine the political status of the great highway.

Costa Rica, through her minister, Senor Peralta, assures us that she will concede a belt of neutral territory for the purposes of a ship canal through her domain, and I am authoritatively informed that Nicaragua is prepared to do the same. Thus the communication so kindly made to us by Senor Peralta marks the second great step in the progress toward an American Isthmus canal, and I have the pleasure of moving a vote of thanks to the honorable speaker.

The vote of thanks was then passed unanimously.

PAPER ON SPITZBERGEN SEAS AND A BOAT JOURNEY IN LAPLAND.

By Alexander Humboldt Van der Horck.

It is with a feeling of the greatest pride and pleasure that I am called upon to deliver the first address on the question of polar exploration in a building which a geographical society calls its own.

All the more so because it is the American Geographical Society; for, my father having been an officer in the United States army, I had the rare fortune to have been born on American soil, and although I have spent many years of my life in Germany and England, still I always turn back to this country as the one to which I belong.

Familiar as I am with the prominent geographical institutions of England, Germany, France, Russia, etc., I have only to say, after having seen the work that has been done here, that this Society may compare favorably with the very best. Yes, more than this:

Nowhere have I seen such zeal and activity displayed in behalf of the interests of a society as in this one; and now that you have a house of your own, that the Society may call its home, now I think you have taken the first and greatest step toward securing its permanent establishment; and under the guidance of the learned and amiable president, Chief Justice Daly—whose illness does not permit him to be with us this evening—of whom Alexander von Humboldt, in his letters to Bunsen, spoke in terms of the highest respect, and whose name is mentioned in Europe coupled only with expressions of the greatest esteem, together with the able management of its other officers, this Society has a future prosperity before it which can make it one of the first, if not the foremost, of its kind. It is a remarkable coincidence that the date of my own birth is the same as that of the incorporation of this Society.

Of what use is arctic exploration? How can it benefit mankind? These questions have been put to me so often of late that it seems to me the arctic explorer has first to answer them in presenting his subject to the public, a public which is growing more and more to view every question from an extreme practical standpoint.

From the disasters attending the Franklin expedition, from the

thrilling descriptions of Kane, the idea has become prevalent that the attempt to enter those ice-bound regions is only connected with the greatest peril and sacrifice.

The world at large has formed a picture of a vast region covered with perpetual snow and ice, utterly barren, almost devoid of life, without vegetation, the awful stillness broken only by the terrible grinding of the rushing ice-masses as they come together with a startling noise, or of giant icebergs closing one upon the other, threatening the mariner with instant destruction; the long winter night covering the earth like a shroud, the short summer of perpetual daylight. What wonder that, with such a picture of desolation in the mind, the question arises: Of what interest to science or commerce can such a region be? The question of polar exploration, the question of arctic discovery, for more than three centuries past, has been a commercial speculation, and the questions of science were either of secondary importance or entirely overlooked. Since, however, it has been proven that the discovery of a north-west passage is of little value to commerce and that the merchant has but little chance in those arctic regions, with the exception of the pursuit of whales, seals and walruses; commerce has abandoned the field and science alone lays claim to this great arctic land comprising more than 1,500,000 square miles. The expeditions sent out from Germany in the last few years have been more for the purpose of making scientific observations and collecting material in the different departments of natural history, until now nearly every year such an expedition is sent to the north.

In the winter of 1875 arrangements were made for a private exploration of the Spitzbergen seas. The expedition was proposed and intrusted to my care by Prof. Hartman, president of the African Society, and vice-president of the Geographical Society; Prof. Virchow, president of the Anthropological Society; and Prof. Reichert, director of the Royal Anatomical and Zoötomical Museum, all of Berlin. My instructions were to make deep-sea dredgings and measurements determining the temperatures of the deep-sea climates and the oceanic currents, collecting zoölogical and other material; and completing these, to return overland and make anthropological investigations as regarded the inhabitants of these northern coasts. We left Hamburgh, by steamer, early in the summer, following the Norwegian coast, across the arctic circle, to Hammerfest, the most northerly town on the globe, where our ship, chartered for the purpose, awaited us. We had, however, procured, *en route*, our final

supplies at Bergen, that neat little town, warmed by the Gulf Stream, whose fjord juts into the North Sea. The wild and beautiful scenery of that jagged Norwegian coast, with its bold, rocky outline, impressed us deeply; but I will not detain you with a description, but take you at once on board ship, a tight, well built schooner, fitted especially for arctic service, with a Norwegian captain (an experienced old seal hunter), his mate, and eight stout seamen as crew, besides my assistants and a photographer. We had all necessary instruments and equipments for our work, such as dredges, deep-sea thermometers with patent iron cylinders, hydrometers, microscopes, instruments for taking astronomical observations, et cetera. Keeping close to the coast, we held our course toward North Cape. Although the sun shone warmly, the black rocky hillsides were covered with patches of snow. Towards midnight we came in sight of the high promontory, and dropped our anchor not a cable's length from North Cape. The beautiful weather — the perfect calm of the sea, stretching away toward the north a limitless waste of water — the stern, majestic rock, rising 1,000 feet perpendicularly out of the sea — the rays of the midnight sun (if we may so speak of a sun that did not set) falling in softened splendor directly upon the headland — the transparent purity of the atmosphere, all blended into a scene too beautiful to describe. The remarkable clearness of the atmosphere during these northern summers makes distance so deceptive that the far-off mountains seem to nestle closer, and one dare not trust to the eye in computing distances.

The Sea of Spitzbergen is a large shallow water, from 100 to 600 fathoms deep, extending between Spitzbergen and Nova Zembla.

This basin is of great interest, as the Gulf Stream fills it with its warm waters. The Gulf Stream, after twice encountering the polar current — once east of Newfoundland and once east of Iceland — has its waters cooled more and more until it reaches a temperature of 4.1° Celsius, or about 39.½° Fahrenheit, and being at their maximum of density at this temperature the waters of the Gulf Stream sink below the polar current, which it strikes off Spitzbergen and to both sides of Bear island in June and July; further south, however, when the atmosphere is colder.

Now we find its course more complicated, for as the temperature changes it rises or sinks; and we find the warm and cold currents arranged one above the other, or flowing side by side.

The warm body of water filling the Sea of Spitzbergen seems to

extend to the north-east in the shape of a wedge, the base of which lies between Bear island and the coast of Lapland.

The surface temperatures vary from 50° Fahrenheit off the north coast of Europe, in north latitude 70°, to 36.5° Fahrenheit in north latitude 76° and 77°, during the months of June and July.

We found the line of demarcation between the Gulf Stream and the polar currents distinctly visible. The waters of the former are clear and have a blue color, whilst those of the polar current have a dirty green appearance which is owing, in a great measure, to the multitude of microscopic organisms and decomposed matter contained.

What a wonderful influence upon the climate of this region has this warm current which, after crossing over 5,000 miles of the Atlantic, washes the shores of northern Europe!

I well remember landing on the Island of Tromsoe, in 70° north latitude, on a parallel with the central belt of Greenland, and how I was struck on finding the hillsides covered with beautiful trees and flower gardens. While here I made an excursion up into the hills across the narrow channel to hunt up some herds of reindeer. My way led me through a beautiful valley which was walled in on either side by high perpendicular cliffs, behind which lay the reservoirs of snow and ice which poured their melted waters into the valley over high rocky ledges, these forming lovely cascades, and then rushing on to the sea in small streams that intersected the valley.

The ground was covered with bright green grasses and ferns, while flowers, such as the blue forget-me-nots and the purple geranium, dotted the earth, and patches of white reindeer moss hid the naked rocks here and there.

The balmy air reminded me of the perpetual spring that is said to exist on the high plateaus of the Andes.

Although it was near ten o'clock at night, the sun was shining warmly, and coming to a shady grove of ash and birch trees, some of which were from thirty to forty feet high, I threw myself on the ground with my coat off and took out my journal to make a few sketches — reflecting upon what a remarkable world of ours this is — when my reverie was interrupted by a faint musical sound, and suddenly I found myself attacked by a swarm of mosquitoes, which soon became so troublesome that I had to leave. It is mostly on account of the insects infesting the valleys in summer that the Lapps leave their winter quarters, and with their large herds of reindeer wander up into the mountains and high plateaus bordering on the coast.

A little north of Tromsoe is the valley of Alten — the paradise of

Lapland, as it is called — where the Norwegians, who settle here on account of the fisheries, sometimes raise small crops of barley, potatoes and garden vegetables during the short polar summer.

But we have gone back on our way. From North Cape our ship took a N. E. course, it being our intention to beat about in the Spitzbergen seas off the coast of Nova Zembla. Life on board ship was very pleasant, although we had but little spare time, our observations and dredgings being continued day and night — that is, literally speaking, there was no night, as the sun, during the brief summer solstice, is constantly above the horizon. The greatest harmony prevailed throughout.

A little undesirable variety was the insubordination of our crew at one time, under the inspiring influence of too much whisky, which had been taken from the lockers without the formality of asking permission. A superabundance of spirits was the consequence, but subjugation soon followed. The Norwegian sailor, like all other nautical natures, has a peculiar fondness for "strong drink." The health of all on board was excellent, the men being accustomed to the arctic seas.

We often came in contact with drift-ice, but our ship sustained no material injuries. Finally we struck the large field of pack-ice.

I well recall the clear, bright morning when the lookout first called "ice-blink to the north'ard," and a scene of surpassing beauty lay before us, as we drifted nearer. One great, unbroken field of ice, as far as the eye could reach, lay glancing and glittering under the morning sunbeams; here and there were high hummocks, or ridges, irregularly piled upon the surface, where the ice-floes had been jammed together, all sparkling and reflecting the rays of a cloudless summer day. We sailed along the edge of the pack many days, sometimes shut in between the detached masses, but nowhere able to make a passage through the field.

Numbers of seals lay on the edges of the ice, sunning themselves, and tempting us to lower our boats and make an excursion in their behalf. They appeared but little disturbed by our presence and nearer approach.

Nothing, however, can be more exciting than a walrus hunt. Generally it is best to attack them when they are lying on the heavy ice, for on thin ice or in the water it is much more dangerous. They can shiver ice from four to six inches in thickness when they rise from below and strike it underneath with their heads. I remember on one occasion crossing a field of new ice, with several of the men,

when suddenly a herd of walruses appeared swimming beneath the thin ice, apparently following us, coming up underneath and striking the ice with their huge heads, shivered it into pieces on all sides of us, while we scampered for our lives toward the main pack, luckily near by, barely escaping these monsters.

I will not detain you with a tedious description of our cruise in the seas. Our operations were very successful, yielding us valuable results; and the greater part of the material gathered during the voyage is now in the museums of Berlin, where it is being arranged and determined. As regards our general observations, we found the bottom in the lesser depths, from fifty to two hundred fathoms, to consist mostly of sand and gravel; in greater depths, such as 500 or 600 fathoms, there seemed to be more mud bottom. We found in this numbers of small shells: Some varieties of the mollusca, multitudes of the calcareous and arenaceous shells of the more minute organisms, the most predominant of which were those of the foraminifera and radiolaria. The submarine vegetation is much more meager than might be expected.

Toward the beginning of August a change in the weather, heralded by cold stormy winds, then by heavy fogs, drove our little schooner under pressure of a heavy gale to the south-east. When the weather cleared we sighted land, which, according to our reckoning, must have been in the vicinity of Cape Britwin on the south-west coast of Nowaya Semlya. The weather continuing thick, murky and unfavorable to our further operations, we steered southward, until we entered Porsanger fjord. The stormy weather having by this time subsided, we sailed along the coast, and anchored off Swerholtklubben, an immense rock affording one of the greatest resting places for sea birds in the northern hemisphere.

This huge headland rises out of the sea like a perpendicular wall, traversed by numerous jutting, parallel shelves, where the rock has crumbled away and left ranges of convenient breeding places for the numerous sea birds resorting to the coast in summer. At early dawn, as our ship rode at anchor scarcely 300 fathoms from the cliff, we could see that it was literally covered with birds, packed side by side in countless numbers, every niche occupied. On the lower shelves and rocky ridges were to be seen large numbers of the eider duck, and the teiste (*Cepphus mandtii*). On the higher ledges, and near the top, were to be found many varieties of the gull, also the Norwegian lumme (*Uria bruennichii*). Wishing to see them on the wing, we had the sailors fire the small ship's-cannon, and the loud

report startled the whole feathered tribe from their slumbers. They rose in one dense mass, like a cloud, the flapping of their wings reminding one of the report of musketry. As they passed over our heads in myriads, they seemed to darken the very heavens, and the noise of their flight was startling. Yet, upon looking toward the rock, there appeared to be just as many there; the number was not perceptibly diminished.

We wished to obtain specimens — a difficult and perilous undertaking — as it was necessary to lower a man over the sharp ledge by means of a rope tied around the waist, the chafing of which against the jutting ridges made it liable to break at any moment, and precipitate him into the waters far beneath. We lowered our boats, however, and pulled toward the land, seeking a place of ascent.

Finally a deep ravine was discovered, which led up the aclivity, and we clambered with considerable difficulty to the top.* The outlook was impressive. The sun was just rising, the first time for many a long day that we had seen it thus, for the short polar summer was near its close. The bright ruddy glow of the morning was touching the whitened cliffs, whose rude slopes were covered with wild grasses, moss and lichens. The sea rolled calmly in front of us, whilst behind us lay a stretch of level land, the monotony of whose surface was unrelieved by tree or shrub. I now directed my attention to excursions in the interior for an anthropological investigation of the inhabitants. To this end I fitted out with supplies a smaller and more suitable boat, and took with me seven sturdy oarsmen and a quantity of plaster of paris in well sealed tin cases, with which I proposed taking casts of living Laplanders. My plan was to enter the deeply indented bays that stretched into the interior, until we came to the mouth of the numerous small rivers. Here we unloaded, packed our goods in bundles, secured porters, and started overland. Our porters were the so-called *Sjo* Lapps, or "Sea" Lapps, a set of broad-shouldered, bow-legged fellows, diminutive in stature, who are to be found along the shores of the lakes and streams in summer fishing. They were well adapted to carrying loads; each usually taking about forty pounds, which, owing to the swampy nature of the ground, was a sufficient weight. The bundles were fastened to their backs by coverings of reindeer skin, which met and were securely fastened across the breast, thus protecting the goods from the weather. Thus equipped we marched Indian file along the

* The formation of the rocks of this coast is mostly granite, gneiss, and mica schist.

marshy banks of the rivers. The country abounded in game, the rivers teemed with salmon and trout, whilst water-fowl of every species were in great plenty. Sometimes the scenery was exceedingly charming. The streams of North Lapland are interspersed with waterfalls and rapids, one falling into the other, and thus rendering navigation at many places almost impossible. The entire region is undulating but barren and desolate, covered with short stunted grass or fields of reindeer moss, or interminable swamps intersected with lakes, having the character of the Siberian tundras. Deep valleys marked the water-courses of the numerous creeks and rivers creeping between the hills. The soft spongy ground yielded at every step and made our marches extremely tiresome, especially as the only change was to hard, rough and stony ground. Traversing the hills in this way through the day we would usually return at nightfall to the river-bank to make our encampments. Here the banks were dotted with little groups of stunted trees, such as the dwarf-birch, etc.

By these incursions we gained much information concerning the wandering tribes of Lapland. These people call themselves, in their own language, *Saame*, and are divided into two classes, the Nomadic or Mountain Lapps, and the Sea Lapps, the former wandering about in isolated families over the high plateaus during the summer with their large herds of reindeer, whilst in the severe winter they retreat to the fir-woods where their herds may find moss while the country is covered with snow and ice. These herds of reindeer sometimes number several thousand head. At one time, when the warm south-west wind caused large numbers of the animals to wander toward the coast, I had the rare fortune of seeing a herd numbering nearly 8,000. As far as the eye could reach the naked hills were covered with them, some with perfectly white skins, whilst others of dark color gave a beautifully checkered appearance to the whole, and the huge antlers towering above their heads seemed like a forest of leafless branches. The Lapps who were present showed us how they used the lasso, in the throwing of which they are very expert. The study of the Laplandic tribes has become of the greatest interest to anthropologists. Their physical characteristics are very peculiar. They are an exceedingly small race. The head is broad (brachycephalic) but low from base to crown, so that the face has a broad compressed appearance. The eyes are usually small and irregularly shaped, slanting downward at the outer corners. The nose is broad and flat, the mouth large, the ears small and well shaped.

The hair is smooth and straight, but the beard of scanty growth. The upper portion of the body is large and well proportioned, arms long; the legs, however, are short and disproportionate, usually bowed, with the knees standing far apart. Their food is the flesh of reindeer, wild beasts, fish, and the berries growing in the extensive swamps. They are also very fond of fat, grease and oil, and come down to the whale fisheries on the coast to gather pieces of fat, blubber and meat, standing eagerly around and watching their chance to secure the morsels, even eating them raw. In taking plaster casts of the face I was compelled to rub the skin with olive oil, and always found it very difficult to restrain them from licking it away, at least as far as they could reach it with their tongue. To prevent this I afterwards applied stinking train oil, but with no greater success.

The Lapps live mostly in tents of poles, over which skins are laid. The costume of this people consists, first, of a curious head-dress, the men wearing high, broad-banded caps, the top of which resembles a thick cushion about a foot square. The women, on the other hand, wear a cap into which a large carved piece of wood is inserted, giving the whole appearance of an ancient helmet. They also wear a large *peske*, or fur coat, generally of reindeer skin, the leggings and long-pointed shoes being made of the same. As they have no pockets it is curious to see the manner in which they stow away every thing inside their coats. They fasten them around the waist by a broad belt and make a forage-bag of the upper story, stuffing into it articles of clothing, shoes, eatables, the fine grass with which they cover their feet, whisky bottles and other things not to be mentioned until the coat bulges out like a huge sack, causing the individual to appear extremely funny with his short crooked legs looking as though they had been stuck through a barrel. The belt, which is of reindeer or bear skin, is richly ornamented with brass talismans, mystic charms, and the teeth and claws of the bear, wolf, glutton, etc. The Sea Lapps subsist mainly by fishing or gathering birds' eggs from the great breeding places on the coast, and present the same physical type as the mountaineers where intermarriage with other races has not taken place. I was fortunate in securing large and valuable collections from heathen graves and a number of plaster casts of living Lapps, the only specimens of the kind in existence.

The difficulties I had in securing these impressions as well as anthropological measurements were great, for I had to overcome their superstitious fears, which were thoroughly aroused, even when I took

measurements with the craniometer. The impressions of the face were secured with the least difficulty. After oiling the skin I covered the features with a thick coating of plaster which, after it had set, usually came off easily. However I was not always so fortunate for upon one occasion meeting an old Field Lapp (Nomad), a splendid type of his race, I desired very much to take his face. After great persuasion he yielded on condition that I should not cut off his beard. I therefore stuck the stiff, bristly hairs together with flour paste as well as I could, and after generously oiling him covered his face with the gypsum. After it had hardened I attempted to remove it when, to my horror, I found that it adhered firmly and I was compelled to take a scalpel and with the utmost care slowly separate the hairs, during which painful operation the Lapp, although lying on his back, struck out with hands and feet; his mouth being closed he made the most unearthly noises through his nose. My men, who were mostly Lapps, stood about in great excitement as they witnessed his agony, and I myself was covered with perspiration. The temptation was great to leave the Lapp to himself to get it off as best he could, but I succeeded finally in securing the form but with it came the greater part of the old man's whiskers. I had scarcely freed him and washed the blood from his face when he sprang forward and furiously grasped my loaded gun which I took from him with difficulty and succeeded in bringing him to terms. In taking casts of the ear I usually closed the auditory orifice with a piece of cotton, oiling the skin and covering the whole with plaster which, when dry, I carefully pulled off, the ear yielding. The operation of "having your ear pulled" is rather painful under such circumstances, and the Lapps were never anxious to let me have the cast of more than one ear!

Skulls can only be taken from the graves with the greatest secrecy as they watch over the burial places with superstitious care. These ancient burials are usually at the hallowed groves, near which they were accustomed to assemble for worship, and they are still designated by the remains of stone pillars or by the native name attached to them, such as "Pattsam dudder" (holy mountain), or "Patts jokki" (holy river). The tumuli are found on the edges of the cliffs bordering on the sea, on the sides of the mountains, or the steep shores of the lakes or the rivers, and are generally of three different forms. The dead are often found wrapped in thick layers of birch bark which have been sewed together with sinews of animals. These coverings are frequently richly ornamented with curious drawings of men and animals, and rude pictures of the former life of the heathen inhabitants.

Toward September I began to make preparations for returning overland, taking a route which has hitherto escaped description. My plan was to proceed from Vadsö to the Patts jokki (holy river), thence across the Lake of Enara (the largest of the Lapland lakes) to the River Ivallo, which we were to ascend; then crossing the mountains forming the water-shed, follow down the River Kitinin to the Gulf of Bothnia, passing through Norwegian, Russian and Finnish Lapland. The greater part of this journey was to be in boats.

Vadsö, our starting point, is the site of the north-coast whale fisheries, and lies 70° 16′ N. L., and 30° E. L. The fisheries are very extensive, and carried on in an original manner. Extensive buildings have been erected on a small island in the Veranger bay. With two steamers, fitted for the purpose, they pursue the swift and dangerous "finned whales" (*Balænoptera rostrata*), which sometimes reach a length of 100 feet. In the bow of each steamer is a cannon, swinging upon an immense steel pivot, from which a curiously shaped harpoon is fired, to which is attached by a chain a long rope. The steamers go along the coast, and as soon as they catch sight of the game start in pursuit, and, when near enough, discharge the harpoon, which sometimes has an explosive shell attached to it. If the animal is not immediately killed, the ship is pulled through the water at a furious rate, until loss of blood makes the huge creature succumb. Sometimes, however, the vessels are dragged about for hours.

All being in readiness for departure, we left Vadsö. Our outfit consisted of instruments, furs and preserved fruits, meats and vegetables, with several cases of liquors and wines, as well as boxes of ammunition and guns, for the country through which we were to pass abounded in game. Some of the larger animals of this region are the wild reindeer, the fox, wolf, bear and glutton, which latter is much dreaded by the Lapps, as it destroys great numbers of their reindeer yearly. The glutton is about the size of a small bear, and perching himself upon the branch of a tree overhanging a deer-trail, lies in wait. As the reindeer come along — as when they go to water — and pass underneath the branch, he suddenly pounces on some unwary buck, and fastening his sharp teeth in the neck of the animal, drinks its life-blood until it is killed, the other reindeer fleeing with fear. I had sent to the south with the ship all the material we had previously gathered. Leaving the island, we crossed the bay and entered the mouth of the Patts Jokki. We had before us a

broad, majestic stream, with high rocky banks, which is the outlet of Lake Enara, its length scarce fifty miles, but in that short distance it has a fall of 400 or 500 feet. In fact, it seems to be but a chain or succession of larger and smaller lakes, connected by waterfalls and rapids, there being no less than eight of the former and twenty-seven of the latter. These present almost insurmountable difficulties for navigation, and sometimes portages of a mile or more in length would have to be made, in which we were compelled to drag our boats over felled trees, or clear a way through the brush. At other times we had to pole up the rapids, so that our progress was slow, and the men, discouraged by the hard work, were only prevented from deserting us by the promise of additional pay and presents if they would hold out to the end of the journey. At the foot of the first waterfall there was a Russian missionary chapel, and around it clustered the huts of the Skolter Lapps. Its cupolas were painted a bright green, which added to the picturesque beauty of the scenery. The second waterfall — Karakoski — was still more impressive, for directly over it projected a high, smooth rock, from which we had a magnificent view of the surrounding country. The waters of Hvalo-jas jaure (or lake) rushed between two high black bowlders in one unbroken volume, as if through a huge stone gateway, and fell into a great circular basin some twenty feet below, causing the spray to ascend far above our heads, then disappeared in a foaming rapid behind a bend in the river. The heights, on both banks, were covered with fir and dwarf-birch trees — the placid waters of the lake stretched away in the distance; over its glassy surface the water-fowl were skimming, whilst away to the south-east we could see a range of blue hills — Piattsam dudder, the "holy mountains" of the natives. The river abounded in salmon, and one had only to drop a line into the swift current below the falls to soon land a fine large fish. The formations in the high rocky banks were very interesting; sometimes great granite bowlders were piled together in huge heaps, giving evidence of the giant forces which at some earlier period must have been at work. Starting at early dawn, we journeyed through the day, making our meals at the portages which were without number. Scarcely would we pass one waterfall before we would hear the roar of the second, and it seemed that we never should succeed in ascending the river. At night we selected a suitable camping place, spreading our furs on the dry ground before a large fire. The nights were intensely cold, the thermometer falling

below freezing point; in fact, this entire region is, according to the latest meteorological observations, the European center of cold. Often I would awake in the middle of the night to find my wet clothes, which, on account of the loss of a part of our baggage in the rapids, I was unable to change, frozen stiff to my body, even while lying near the fire. As our tent clothes had also been lost, and our furs, we had to sleep under the open sky, on a few reindeer skins spread over some fir branches for a bed. However, we kept in good health and spirits. We had ample opportunities for seeing the wonderful aurora borealis, flashing brilliantly over the heavens.

On one occasion we had a rather curious adventure. While crossing a lacustrine part of the river called Kjoalme jaure in the early part of the night, we were suddenly surrounded by swarms of lemmings (*Myodes torquatus*), an animal like the mountain rat. They swam round the boat and attempted to clamber into it, so that it was with the greatest difficulty we could keep the fierce little creatures from boarding us by beating about with the oars, at which they would set up sharp shrill screams similar to those of the musk-rat. After some time we succeeded in passing them. These little animals come unexpectedly down from the mountains, no one knowing exactly whence, and appear in millions, swarming over the whole country, eating up almost every thing that comes in their way. Neither rivers nor lakes seem to deter them, both of which they swim with ease, usually keeping on their destructive path until reaching the open sea, which they vainly attempt to cross, never swerving from the direction once taken until they sink exhausted beneath the waves. Thus perish countless numbers. They commit great ravages, and are as dreaded in the north as the locusts are in Egypt. Years, however, elapse before their reappearance, or until they suddenly descend from their rocky retreats. The Lapps tell us that they rain from the sky; many of them stating that they have actually seen them fall. This idea may be owing to the fact that the lemmings are frequently seized by birds of prey, but the fierce little creatures extricate themselves, the bird loosening his grasp, and thus the prey, to all appearance, drops from the clouds. Their fur is of a red or yellowish-brown color with black spots on the back and the breast white.

Ascending the rapids we lost some of our baggage. At Menikas jaure we came to a village of Russian Lapps, consisting of a few miserable huts and peculiar little houses built upon piles about three or four feet above the ground, most likely store-houses, thus con-

structed to keep their contents from being destroyed by animals such as the lemming. From this place another boat, manned by Russian Lapps accompanied us, as the part of the journey just before us was both difficult and dangerous. Arriving at the place where the boundary lines between Norwegian, Finnish and Russian Lapland meet, I climbed to the top of a hill 450 feet high, from which I had quite an extensive view of the surrounding country. The land beyond the river was naked and desolate-looking as far as the eye could reach, but the valley of the river itself was thickly wooded with fir-trees, the ground covered with reindeer moss. Far below one could hear the faint voice of the waterfalls, or here and there catch a glimpse of the white foam glittering between the trees. Nothing can be cleaner or tidier looking than the beautiful reindeer moss, stretching like a snowy white carpet between the dark pine trees. We crossed the sixty-ninth parallel north latitude, and, after innumerable difficulties, reached Lake Enara, a large sheet of water, triangular in shape, the greatest length of which, from north to south, is about sixty miles; its greatest breadth, from the Patts jokki to the opposite shore, is nearly forty miles. This lake has a great number of affluents, the largest of which are Kamas jokki and Ivallo. The latter we were to ascend. Lake Enara is dotted with innumerable small rocky islands (the largest being about three miles long); some are barren, others covered with trees and moss.

Our men having by this time become unmanageable, we landed on a small island, and unpacked the boats. To avoid wearying you with the troubles that followed, I will only say that the men deserted us during the night, taking the boats with them, and only by the aid of some Fish Lapps, whom we hailed, were we enabled to proceed to the mouth of the Ivallo. Arriving at this place, we found a number of pearl-fishers, from the River Lutto, who offered us, for trifling sums, rare pearls, of a beautiful color, some having the highly valued rose color, which they obtain by diving, and bringing the shells out of the cold streams of Russian Lapland. After procuring men, we continued our ascent of the river, with but slow progress. As the days were growing shorter we attempted to force our journey by pushing forward during a part of the night, using torches. We could also, thus, see to spear the salmon with which the stream abounded.

One can scarcely conceive anything more novel or exciting than poling up these rapids after nightfall. The ascent was sufficiently

difficult and dangerous by day. In the bow of the boat a large pine torch threw sufficient light for us to see the way as we shot into the swift current. The foaming waters dashed between the sharp black rocks with a roaring noise. The men stood erect, pushing with long poles, calling to each other with shrill, incessant cries, above the din of the rapids. At intervals the waves would rush into the boat, wetting us thoroughly as we sat amid the weird, wonderful scene, watching the red glare and curling smoke of the torch or the pictures of wild beauty it revealed to us out of the darkness. The Ivallo is a swift mountain stream, flowing impetuously through a deep gulch or canon between high mountainous banks, and filled with rapids, making its surroundings wild and picturesque beyond description. Something remarkable were the reflections in the water in those parts of the river that were tranquil and deep set. One could scarcely determine or detect the water's edge, the white pebble-stones in the picture being just as distinct as on land, the limpid, unruffled waters scarce discernible as they held the reflected image. I never saw this equaled, and I think it was partly owing to the perfect quiet of the water, and partly occasioned by the transparent purity of the atmosphere. The frequency of mirages in the polar seas also struck me. I recall once seeing a rocky island that lay off the north coast, raised high in the air, seemingly enveloped in a silvery cloud.

At the new gold mines in Kultala, we secured porters, and immediately prepared for our journey over the mountains. These mines (which were first opened in '71) are in full operation, and seem to be yielding richly. They are in the hands of the Finnish government, work being carried on only during the two warmest months of the year. I saw many bags full of bright yellow nuggets, some of which were very large. The whole place has the character of a busy mining camp — the long runs; the cradle on the river-bank; the men with their picks; and every where the large stoneheaps that had been dug up while in search of the precious metal. We now ascended the steep river-bank, which is between 800 and 1,000 feet high. Upon reaching the top we found ourselves on a high plateau — the watershed which casts the waters to the Arctic ocean and the White sea on one side, and to the Gulf of Bothnia on the other. This range of high land was covered with small pine or fir trees; countless springs issued from the earth; large swamps extended over the whole region, ever intersected by small creeks and rivulets. We followed the course of the Kivi jokki, a small branch of the Ivallo. When about

half way across the plateau we came to a lake called Wavololampi, lying on the highest part of the mountain ridge. It was a very peculiar reservoir — about three miles long and one and one-half miles wide — for the waters were flowing from it both ways; that is, to the north, through Kivi jokki, into the Ivallo, thus connecting with the Arctic ocean; and on the other side the Wavollo oya flowing out of the lake into the Kitinin, forming a water-link of communication between the Polar sea and the Gulf of Bothnia. On one side of this lake lies a large swamp, through which the Kivi jokki receives its supplies; but during the dry season this communication ceases, and a dry ridge of land separates the waters flowing to the north. Thus it may be said that the Scandinavian peninsula is an island during a part of the year. We camped on the border of this remarkable lake for the purpose of taking observations and making sketches. Nothing could surpass the natural beauty of the place, whilst the abundance of game of delicious flavor enhanced the pleasure of scenery. We now descended the Kitinin river to the Gulf of Bothnia, and crossed to Uleaborg, where we were cordially welcomed by the governor of Northern Finland, and at whose residence I remained some time to recover from the many hardships, and then took my way across the great continuous lake system of Finland, reaching St. Petersburg, and from there returned to Hellingafors, the capital of Finland; then onward to Sweden and Norway, returning to Berlin in the beginning of last winter.

Before closing my lecture, allow me to make a few remarks in defense of polar explorations. I have read with interest the ably written articles by Dr. Hayes, who, as you all know, ranks among the foremost of arctic explorers. Many may think his expressions were too forcible; but I can only say that it proves that the doctor spoke his open, honest conviction, like one who is with the matter heart and soul. And who will escape a keen sense of disappointment when an an expedition so splendidly fitted out meets with such adverse circumstances as the best of us cannot control?

Picking up a newspaper a few days since, I read the following: "The subject of polar exploration was never more in disfavor than now. The return of the Alert and Discovery has conclusively shown how little of interest there is in those far-off regions to warrant such vast expenditure."

But this is a fallacy in popular opinion. To those who have searched more deeply into these questions, to those who have entered

the "pass," and stood on the threshold of its mysteries, quite a different view is presented. Every step finds us surrounded with objects of interest. We see the workings of nature, of whose grand forces we have scarce a solution. A new era in the history of our globe will dawn when the revelations of knowledge hidden within the vast area of this yet undiscovered region, are brought to light — for the relation which this region bears to the position of the axis of the terrestial spheroid, and its peculiar character, give opportunities for observing many phenomena under singular relations; while the conditions of the earth's surface, and the valuable field of research for the geologist, are to be considered. In fact, it is but reasonable that we should expect rich and unforeseen discoveries in science, of which as yet we have no conception. The first great advantage to commerce in the early history of arctic exploration resulted from discoveries by Henry Hudson — that brave, intrepid sailor; it was the establishing of the whale fisheries, one of the most extensive trades that has ever flourished, in which large fleets, of almost all nationalities, were yearly engaged, and even now the Dutch are organizing a new expedition to search for new grounds. Immense have been the revenues collected from this; close upon this followed the profitable pursuit of the hunters of seals and sea-horses. A Siberian explorer named Liaghoff, by observing a herd of reindeer coming from the north over the ice, was induced to seek land in that direction, and traveled with sledges across the ice, until he came upon three large islands, since known as New Siberia, the largest of which, called Kotelnoi, lying in 76° N. L., is 100 miles long by sixty miles broad. Here Liaghoff found immense alluvial deposits of remains of animals, fossil bones, wood, etc., not unlike those found along the whole arctic coast of Siberia. He obtained from the government the exclusive right of digging for the bones of the mammoth. The deposits were so great that in one year no less than 20,000 pounds of fossil ivory were gathered. To what reflections do these remains of ages gone by lead us! Here that huge and wonderful animal, the mammoth, must once have ranged in perfect freedom over these now trackless wastes of ice and snow. The very wood tells of by-gone vegetation now extinct.

From these islands Hedenström Anjou and other Russian explorers thought they discovered an open sea to the northward, the so-called Polynia, about which there have been the wildest speculations. Wrangell, too, in his explorations, saw dense vapors rise in that direc-

tion, and finding the winds blew from there freighted with moisture thought it a still further evidence. Many examples of this kind might be quoted, the expedition of Nordenksjöld, in the last year, apparently opening a way by which the riches of Siberia and the products of the fertile countries marked by the watercourses of the Yenisei and Obe, may find their way to European waters.

Then there is the finding of valuable minerals in these northern latitudes,—the gold mines in Lapland, discovery of cryolite in Greenland as well as meteoric iron extending a distance of nearly 200 miles. Are we not already ready to advance farther into this vast realm of marvelous interest? But let us turn now to science and see whether it may be profitably enriched by arctic explorations. We know that the Arctic ocean teems with life, and in disclosing the more minutely organized animal life by means of dredging machines we find an important chain in the economy of organic nature. Of the larger inhabitants of this sea, the whale, and the numerous varieties of fish, very little is as yet known, either of their movements or the relations they bear to one another, or the condition under which they live, or their migrations and distribution as regards geographical area and oceanic currents. It is conjectured that the whales journey to the far north, during a part of the year, where they must find open water. The presence of the walrus is also a sure indication of the existence of submarine vegetation. The migration of certain birds northward is suggestive; passing in their summer flight over those barren tracks across southern Greenland they must necessarily find food in the far north, which leads to the inference that beyond the zone already explored some more genial clime must exist. Here, too, is the habitat of such terrestrial animals as the fox, bear, reindeer and musk-ox. Thus, in a zoological point of view, questions of great interest arise. So it is in botany. There is a rare and peculiar vegetation in these northern regions of which we know as yet but little, and naturalists anxiously await further results as they may greatly help us in determining the geographical distribution of plants. In the science of anthropology we may look to important results in these arctic regions. The races inhabiting the extreme North are becoming objects of the highest interest, as to whether they are offshoots of certain races living in the more temperate zones who have degenerated under climatic influences and the peculiar conditions under which they exist, and have thus become pathological, or whether their physical and psychological peculiarities are typical of a distant race or races.

How far may the past history of man be involved in bringing to light this subject? But little more than a third of that unknown region has been explored, yet amid its most barren solitudes the traces of former inhabitants are found, and although these are the remains of past ages they tell us of the wanderer of those by-gone periods and show us that man has once dwelt in these lonely wilds. He has been traced as far north as 81° 30′, and it is plausible to conjecture that he has existed still nearer the pole, although the English expedition found no remains beyond this latitude.

We pause, bewildered with the primeval panorama of "umbrageous grots and caves of cool recess;" we breathe the balmier air and over the lapse of centuries clasp hands with man and ask, Why this transformation of nature? and Why these icy sepulchres entombing the redundant foliage? The mysterious rovings of these isolated tribes deprived of metal and wood, dependent, as they seem to have been, upon such materials as bone and stone for the construction of all utensils, implements and weapons, place them in close relation to the human being of the prehistoric age of stone. The geological results of polar exploration will be of the greatest value. There are the paleontological evidences of life underlying the glacial period, the organic remains discovered in the carboniferous and miocene rocks, each revealing facts of the highest importance to geology, giving evidence that in the far-off past there has existed a highly developed and exceedingly luxuriant vegetation. The relation which the miocene (middle tertiary period) flora bears to preceding and succeeding vegetations is a subject of weighty consideration, also the light it throws upon the physical condition of our planet in past geological epochs. When we reflect upon the probably forced migration of the Scandinavian flora, supposed to be one of the oldest, to Greenland and America, when we have positive evidence of the existence of ancient forests in a warmer period preceding the glacial, when we picture to ourselves those days of antiquity when the mammoth, and other huge animals, long since extinct, stood in the shade of dense woodlands, where now vast wastes are bound in by the perpetual barriers of snow and ice, we marvel at the changes our earth has undergone. Great tracts of land formerly above the ocean are now submerged; could these be raised again above the water, this replacement of water by land would still be insufficient to account for the phenomena of to-day. It is asserted that these great revolutions afford evidences of changes in the angle which the earth's axis

forms with the plane of its orbit, and that the ellipticity of the orbit itself has varied greatly.

In all branches of physics experiments near the pole are most desirable, because of the supreme or intense workings of nature's forces there. Opportunities for the spectrum analysis are here best and surest, because the sun is at low altitudes above the horizon; only in such high latitudes can we separate the terrestial from the solar lines in the solar spectrum. By the same means we may be able to discover the chemical elements involved in that mysterious and beautiful phenomenon, the northern lights. The observations by means of the pendulum, as made by Sir Edward Sabine, are of special value to geodesy or geodetic measurements; but until we can make these at or near the Pole itself, so long must the results be incomplete and doubtful. The connection between geodetic and astronomical measurements with local gravity make it of the highest importance that the pendulum observations should be more complete; for the assumption regarding the peculiar form of our earth — the supposition that the earth's surface, and each adjacent stratum of invariable density, are surfaces of revolution, and connected thus with the ellipticity of the earth — has by some been considered incorrect, and it is therefore very desirable that it should be verified through actual experiment still further north. Whilst, in meteorology, a precise knowledge of the distribution of land and water within the pole areas is essential to understand how far the climatic and atmospheric conditions of the globe are affected by it. We have but to look at the valuable work done by the Swedes and Norwegians, who are now so active in northern explorations, and the meteorological charts of Professor Mohn, of Christiana. Laying aside all these questions of scientific significance, the simple desire to complete the geographical knowledge of our earth would be a sufficient incentive to enter upon this vast unknown. The very divinity within us impels us to trace in all directions the mystic footprints of nature.

Can you link together the hurried thoughts I have thus given you, and not feel that our first question is answered, and that, practically, it is a great accession to human knowledge, and of such significant value to mankind that it is a most laudable ambition to seek a pathway to the poles of the earth — in fact, a duty not to be lightly thrust from us? As to the difficulties to be encountered: in contradiction of all that may have been said and written, there is scarcely more of danger to beset the mariner in these polar seas than

is common to all who "plough the changeful deep." Nor should imaginary fears make us unreasonable, or difficulties weaken our purpose. The extreme healthiness of the arctic regions is a fact well established, and it has been observed that persons suffering with pulmonary or bronchial affections were exempt from them whilst in those latitudes. Official statistics have shown that, of almost all seas visited by government vessels, the polar waters have been the healthiest.

We would not think unkindly of those gloomy theorists who look only upon the dark side of the picture, but say to them, that with the experience gained by the many preceding failures, with the advanced methods for scientific investigations, with the service of good steamers properly provisioned, and especially by establishing permanent stations and supply-depots, which may be surely and safely pushed northward, we need not apprehend insurmountable difficulties, nor think it impossible to penetrate solitudes that may never have been disclosed to the eye of mortal.

Mr. Jas. T. Gardner moved a vote of thanks to Dr. Van der Horck, and said: I would call the attention of the Society to the special significance of the interesting paper read before us this evening, as it indicates a profound change taking place in the character of arctic exploration. There, discovery of new shore lines and channels, formerly the leading object of voyagers, has already become of secondary importance to the investigation of those great natural laws which govern arctic life, arctic climate and arctic currents — laws most easily comprehended in those regions, where their workings are on a Titanic scale, though their effects are felt as certainly in our own atmosphere, and in those ocean currents of the Atlantic and Pacific whose temperature, strength and direction control the very distribution of life and development of civilization.

The vote of thanks to Dr. Van der Horck was then passed unanimously.

THE REPUBLICS OF SOUTH AFRICA.

By Miss Russell, of Victoria, South Africa.

SPECIAL MEETING, DECEMBER 22, 1876.

Chief-Justice Daly, the president, introduced Miss Russell, saying that America could but be deeply interested in the condition and prospects of sister republics in southern Africa, of which it is so difficult to obtain any information, except through unfriendly sources. The Society desired to avail themselves of Miss Russell's presence in America to learn from the lips of a native of Victoria, South Africa, of European parentage, something of the spirit and life of the people, and had, therefore, invited Miss Russell to address them. She announced as her subject:

The Republics of South Africa.

In bringing before your notice to-night the great continent of Africa, I only touch a chord which is vibrating throughout the world. I believe I may justly claim that at this time Africa in general is attracting considerable interest from the civilized world. Stanley's explorations in Africa are familiar to every American. The English, the French and the Italians respectively have exploring parties in Northern and Eastern Africa; and under the auspices of the Paris Geographical Society, an expedition is now fitting out to explore Africa from the Mediterranean to the Gold coast. And that the importance of this great question of opening up Africa to develop its resources, to maintain the increased trade and commerce which every generation brings, is becoming more fully impressed upon the thoughtful mind, I remind you of the proposal of Leopold II, King of the Belgians, to form an international society for the exploration of the unknown regions of the vast continent, and also of the address of Sir Bartle Frere to the Glasgow chamber of commerce, on the same subject. I merely mention these facts as all included under the one broad basis, but let it be understood that what I have to say concerns Southern Africa only.

I have no doubt you will wonder what my object is in bringing before your notice to-night the South African republics and their

people. In the first place, I want the American people to know that these republics exist in South Africa, and that their people have had a hard battle for their independence I hope to prove to you. If you will take the map of Africa, looking at the southern portion, you will find north of the British colonies of Cape of Good Hope and Port Natal, lying between the Orange and Zambesi rivers, the tract of country which is occupied by the Orange Free State and the Transvaal or South African Republic. These republics constitute the richest portion of southern Africa. The government, as you will naturally infer, is republican, having a constitution very much the same as your own — the president being elected every four years by suffrage of the people, and the congress (*volkstaad*) representing the people. Now, I consider that, in laying a true statement of the republics before the American people, they are far more likely to sympathize with countries whose government is the same as their own, and for that reason, it is better, in opening up the land, that commercial relations be established with America. Americans coming into the country would respect and uphold its government, and this new feature would add strength and force to the administration. At this present time America is seeking about for new markets to support her increased manufactures. Now, though at first sight my remarks to-night may appear to have no connection with this all-important question, I know that in a few years it will have assumed such vast proportions as to surprise you. It is in the natural course of events that the construction of a railway from the eastern coast into these South African republics will develop the mineral and agricultural wealth of the country, and open up a market which would drain America of its surplus manufacture, and add ten-fold to its prosperity. While I am telling you of it to-night, this very thing is in course of progress, and if it had not been for the interference of a foreign power who has sought to arrest the progress of the republics, seemingly for its own ends, the railway would be now more than half completed; but there is a power in Europe that would be glad to expunge the republics, and embrace them under her own rule as colonies. The wealth of the republics which has been not inconsiderable, diamonds to the amount of between £8,000,000 and £12,000,000 sterling, wood, feathers, ivory, skins, all have gone towards enriching the commerce of England; and it would now appear that she is no longer satisfied with this, but wants the republics entirely. Now, it seems to me that, by making the country better known, trying to

clear away some of the mystery which seems to shroud it, I, at least, give people a chance of judging how fair such a monopolization would be. Nations, like persons, are more cautious when they know they are watched; and at the same time, I may remove some misrepresentations which have crept into the press respecting the country. The people of the republics have been represented as wishing to have British rule. Nothing could prove better than their history the error of this statement. And to this end, I shall now go on to tell you something of the people who live in the republics, and the way they obtained them. Before we can become interested in a country we must learn something of its people and its history; and this is why I desire to let you know something of the Boers of South Africa and their republics. The Boers are the descendants of the original Dutch settlers of South Africa. The object of these early settlers was to establish an independent form of government in South Africa, and to this end they struggled all their lives. *Boer* is a Dutch word, which means "agriculturist." The Dutch have become almost wholly an agricultural people in South Africa, and hence they are called Boers or "farming people."

Let me, first of all, notice two facts with regard to southern Africa, which demand primary notice. The burning hot climate it is represented to have is all a myth and a fable, and there are no savages there; for people who conduct themselves in an orderly and respectable manner, and are not given to the committal of savage acts, are certainly not savages. Having noticed these two leading points, it is now necessary for me to preface my subject by the barest facts of history, in order that you may more clearly understand it.

In the seventeenth century the Cape of Good Hope, which is the most southern point of Africa, was colonized by the Dutch. In the course of half a century they had built up a flourishing colony, and had made considerable progress — such progress as seemed to destine for Africa a name in history; their numbers had been further added to by a colony of Huguenots, who fled from France at the time of the persecution. These Huguenots, in the course of several generations, have become so intermixed with the Dutch that, beyond their names, no trace of them as a distinctive race remains. It was they who introduced the culture of the grape, which then, as it does now, formed one of the chief industries of that colony, and added much to its prosperity. The traces of all this work still remain, and Cape Town, the capital of the Cape of Good Hope, retains at the present day very much its

early character, being essentially Dutch in its architecture and general appearance, and many of its fine orchards and vineyards owe their origin to those early settlers.

In 1806 the Cape of Good Hope became a British colony, and it was from British rule and British taxation that a body of these Dutch banded themselves together and resolved to trek further inland and settle themselves independently, and beyond the reach of British rule. *Trek* is a Dutch word, which signifies "to go." To me it seems a comprehensive term, as it is usually applied to wagon and oxen traveling, and by the word *trek* the oxen always understand they are to go. This band of pioneers trekked northward and found in Natal their promised land. The old work had to be done again — the natives subdued, and new settlements laid out. Pietermaritzburg, the capital of Natal, is named after two of those worthy old pioneers, who have thus become identified with its history for evermore. The sequel proves that their rest was not here, for the English appeared again on the scene, and after a considerable resistance on the part of the Dutch, in 1845 Natal became a British colony. For a second time these determined people, the Boers as they are now called, resolved upon a second trek, and once more they were pressing into the wilderness in search of a home. They settled this time south of the Vaal river, and named their new territory the Orange Free State. It is necessary here to mention that the Boers, as pioneers, have resorted as little as possible to the force of arms with the natives, but have always endeavored to negotiate for the honest purchase of the lands. In 1848 the Orange Free State was annexed by the British; but though resistance, on account of the inequality of numbers, would have been useless, the spirit of the Boers had not yet deserted them, and once more they were on the trek, searching for a fairer land of promise. Crossing the Vaal, they settled the country north of that river, and in the Transvaal, or South African Republic, began to feel some security. In 1856 the Orange Free State was handed back by the English to its original owners, the Boers, they having found it nothing more than an expense and an incumbrance. And now, side by side, these two republics are growing up, with such a fair future before them that their neighbors are becoming jealous. From this account you will see that the Dutch have not enjoyed much peace in South Africa. In fact, they have lived a life of perpetual turmoil and insecurity; and the difficulties a new country presents, and hostile natives, have not been their worst

enemies. In all these emigrations of the Dutch in search of the coveted boon of independence, some have always remained behind; so that all over South Africa the Dutch are to be found, in the Cape of Good Hope in a large majority, and very considerably anglicized.

There is the ring of the true metal — that is, a calm, settled, and sturdy independence — in the steady perseverance with which the Boers have resisted all attempts to place them under British rule. It must have seemed to them, in all the years of peace and quietness which have since gone by, that they had found their haven at last. They have tilled their lands, and in the rich yield of crops and luxuriant gardens teeming with luscious fruits, they have found almost all their simple habits required. They have hunted the wild game, and lived a life of ease and indolence. As may be imagined, their progress in letters in this nineteeth century has been very far behind that of the rest of the world, their life being one not calculated to foster a love of the gentler arts of life. Camping in the wilds, encounters with the natives — many of their lives are brimful of such startling adventures and thrilling romance as no novel could adequately portray, or any of you folks of this work-a-day world gain a conception. But with praiseworthy painstaking, from generation to generation the knowledge of reading and writing has been handed down from parents to children, until at the present day there are few who cannot read and write a little. Some of the men show themselves fair mechanics. They build their own houses, make their own furniture; they are their own tailors and shoemakers; the women are famous at the manufacture of soap, tallow candles, and in the art of drying fruits. Their soap has quite a name among English residents for its economy and power of cleansing. Though the industries and manufactures of these simple people are very rude, yet, when we remember that for two hundred years they have had no means of improvement, there is much credit due to them for the intelligence they still display. The pious spirit of their forefathers seems, in spite of all their misfortunes, to be still strong within them, and in this respect they set an example to less forbearing Christians. Their morning and evening hours they devote to praise and prayer. They are strict church-goers, and have a great reverence for their minister, whose position is that of a little king among them. They obey his rule implicitly, and his influence is almost absolute. The minister generally resides in a town, and every now and then pays a regular round of parochial visits to the members of his flock, who are

scattered over a wide tract of country, residing sometimes more than a hundred miles apart. Every three months *nachtmaal*, or taking of the sacrament, is celebrated at the church, and every family who can possibly manage it makes a point of being present, though with the mode of South African traveling it often costs them a journey of two or three days. At these times they camp out around the church, and the minister has additional services for the benefit of those whose distant homes render them unable to attend but at these times. This is a grand harvest time for the minister — for of all the six or seven hundred families who come for nachtmaal, not one but has a very substantial present for the *predikant*, as they call him. Some of these presents consist of sheep, others of bags of meal or flour, butter, eggs, soap, fruit, and an endless variety of rarities, until at length minister and his wife are both at their wits' end where to put the things which crowd upon them. The presents bestowed at these tri-monthly gatherings would often be enough to keep the minister and his family for a year; but he generally disposes of the surplus by selling to his neighbors, and is thus enabled to add to his income.

The republics and the British colonies are on amicable terms; the produce of the republics has been one of the chief features of the colonial trade, and all imports to the interior are supplied by them. Until within the last few years, it was customary for each Boer family annually to pack up such goods and chattels as were necessary to the trek, and with their wool, skin, butter and other produce to make a journey to Natal, their nearest market. I may mention here that the Boer's method of traveling is by wagon and ox-team, which no Boer is without; and he always takes his wife and children with him. The Boer's mode of traveling is the characteristic one of South Africa, and by the means of wagons and ox-teams all goods are conveyed to the interior by men who call themselves transport riders. To you, with your railways and rivers, a journey of three or four hundred miles is a matter of little moment; to us it means a six weeks' picnicing campaign; we must lay in a store of provisions and such articles of household comfort as are necessary to life anywhere, and resign ourselves to a camping life, or, as we term it, *avelat* life. To some natures this quiet, dreamy existence is full of charm; it is healthy and indolent; there is plenty of time for reading and sleeping, and good appetites never lack. A journey of this kind often produces a wonderfully beneficial effect on invalids; to ladies it offers an opportunity to get through an immense amount

of sewing; and to the thoughtful and scientific it abounds with interesting studies. Round the camp fire of an evening the scene is often most inspiriting; busy hands preparing supper; merry jesting growing merrier as the fragrant odor reminds the hungry travelers that the meal is ready; the loud talking of the natives, and the sad music of the concertina, adds to the picture a wild and weird charm which would draw forth the artist's fancy. But to resume. This journey of the Boers' to Natal, under favorable circumstances, occupied between three and four months, but the Boer's time was not much an object to him; there was no pressing business to hurry him home, and nothing to be lost by his absence. In Natal there were many stores whose goods were solely for the Dutch trade, and it was in the Dutch season that they looked to make a grand harvest; these different stores would send out *touters*, or men on horseback, who met the Boers as they were near the city; these, in the interest of their employers, inquired the nature of the produce, and represented to the Boer where he was most likely to be best compensated for his goods; the Boer was easily persuaded to the touter's views, and generally accepted the recommendation. In many instances the storekeepers completely duped the unsuspecting Boer, using short weights and making false calculations, and when the family turned to go homewards, a few pounds of coffee and sugar, a few articles of clothing, and a few tawdry things selected by the good wife, would be the only return they would have for their merchandise; and yet they went home rejoicing and content, without a suspicion of the frauds practiced upon them, and returned again the next year. Some years ago this system of cheatery was completely exposed; and traders of good repute settling in the republics, the Boers now find it pays them better to stay at home than to go to Natal. I believe that at no distant day the colonies will have nothing left but the memory of their trade with the republics. The president of the South African Republic recently raised in Holland the sum of $1,500,000 for the construction of a railway between the republic and Delagoa bay, a Portuguese seaport on the eastern coast. The distance of this seaport is about 100 miles from the republic — one-third the distance of the nearest British colony. Delagoa bay is one of the finest natural harbors in the world, but the barrier between the republic and this sea-coast has been a narrow belt of low-lying country, stretching to the coast below the Lebombo mountains. During the summer months this tract of country is very unhealthy, and it is inhabited

by a fly called *tsetse*, the bite of which has a fatal effect on domestic animals. For years past this fly has been the subject of controversy, and no solution of its destructive powers has yet been arrived at. In view of the railway, the Portuguese have been for some time past engaged in planting in this unhealthy strip of land, large quantities of the *Eucalyptus* and other trees of an anti-febrile nature, and the probabilities are that this may prove a double benefit, by exterminating the fly as well as ridding the country of unhealthy vapors.

Within later years the growth of the republic has attracted considerable immigration of English there. Though the Boers recognize the advantage these bring with them, and find the increase of trade improving their condition, they look with distrust on these newcomers; they have never worked them well yet; and as their numbers still keep increasing, they grow decidedly uneasy, and it is scarcely a year ago that about a hundred families sold their farms and trekked farther northward to get beyond British contact. At the head of each republic there is now to be found two of the ablest men of South Africa; both are of Dutch descent, but educated in Europe. Thomas Francois Burgers, President of the South African Republic, is a man on whom too high encomiums cannot be lavished — an orator, a statesman and a soldier — of whom Mr. Froude, the British historian, said: "A man who will make his mark anywhere." This was verified, for shortly afterwards, when Mr. Burgers visited Europe, he was entertained by all the crowned heads, and returned loaded with honors, and with his mission successfully accomplished. This mission was to raise the railway loan. Mr. Burgers is a patriot of the genuine stamp, a man who would suffer and sacrifice for his country; he is one of a class in South Africa who, having descended from the early settlers, would be glad to be proud of their nationality, to feel that they had a country to claim. Mr. Burgers is the one who has made this something more than an idea, who has shaped it into action, and if God spares him to complete the work he has begun, he will give South Africa a name in history, and make it a country from which we shall be proud to claim a birthright. It seems like a providential interposition that, at this critical period of their history, the Boers should have secured a man of Mr. Burgers' ability, a man so well fitted to tide them through the present difficulties of their situation, and bring them to the goal which but for him would seem further off than ever. Within the last seven years only the Orange Free State has developed rich diamond fields, but the advantage

accruing to the country from this has been less than the disadvantage; for it has only brought in a hungry crowd of fortune seekers, who have made their money and turned their backs with contempt on the country which gave it. It is an astonishing fact that the diamond fields have yielded £12,000,000 sterling worth of diamonds, and yet the world scarcely knows that diamonds are found in South Africa. Had the diamond fields been some huge bubble scheme, whereby £12,000,000 had been lost, I venture to say the length and breadth of the world would not have contained room for the news. The South African Republic has developed gold fields, which give a fair prospect of being rich and lasting. These gold fields were opened in 1873; at present there are about 400 miners at work there. The labor for the white man is comparatively easy, native labor being cheap and obtainable. The only tax levied on the miner is one of a dollar and a quarter per month; this licenses him to possess a claim — ground on which to live. Wood and water for all is abundant; no extra tax for this is levied, the only difficulty being that each miner procures his own supplies. The South African Republic is beyond doubt one of the richest mineral countries in the world. In confirmation of this statement, I quote from the report of Mr. John Provis, mining engineer and metallurgist, sent out to the country by a wealthy London firm with a view to obtaining a knowledge of its mineral resources. He says: "Among the precious metals gold has been extensively found, as is well known. Not being a practical gold miner, I am unable to give a competent opinion, but I am assured by gentlemen who have devoted their whole life to the work, that the gold fields bear every evidence of being rich and lasting. Silver has been found in connection with lead at several places. The galena contains silver in various proportions — from three to eighty ounces per ton of ore. Lead is found in abundance in some parts, especially Marico; copper also exists in abundance in the Zoutspansberg district. The South African Mining Company has been several years engaged in working a rich cobalt mine to the north of the town Middleburg. Cobalt is a very valuable metal, and I am pleased to say the company's efforts have been attended with success." Again he says: "Coal and iron in abundance. At one place, Havre Klip, I examined the coal strata, and found a seam of coal cropping out to surface seven feet thick; there were also two or three other smaller seams; the coal formation here extends for several miles, and it has been discovered, too, near Potchefstroom. The non-metallic minerals are many, and though not

containing metals useful to man, are, nevertheless, valuable as indications of the more useful minerals." There is no doubt that years ago the Boers knew of the existence of gold in this country, but they kept it a secret, fearing the influx of a British population. As it is, the English claimed the diamond fields — the Boers lodged a protest, and a long contest of words and paper ensued. Eventually, and within the last year, Mr. Brand, president of the Orange Free State, personally visited England to lay the case before Earl Carnarvon, secretary for the colonies. The result of this visit has been that the English government have retained the diamond fields, giving to the Orange Free State £90,000 as a compensation, and a grant of £15,000 in aid of a railway. Though this does not give the Boers back their land, yet, as a colonial paper justly remarks, the very fact of the English government giving compensation is a tacit acknowledgment of wrong. For their treatment of the Boers the English have always made the natives their excuse; they have accused them of unjust dealing towards these people, and they have charged them with slavery and oppression. This has been done more in ignorance than aught else. It is only fair to say that the Boer has a just regard to the native as a human being, but otherwise regards him as the inferior of the white man. According to Boer law, no native can possess land in the republics, but is permitted to settle almost anywhere by payment of a small tax. Tribes subject to the republic live on lands allotted to them by the republic, are subject to their own chiefs and have their own laws, and live as uninterfered with as though there were no white men near. There is no labor law, as has been stated, enforcing them to work, and the tax levied on them is merely a nominal one. The Boer does not believe in the equality of the two races, and imbues the native with a great respect for his person. It is wrong to call either the Boers or natives degraded. Because they are untutored and unlettered, it does not naturally follow they are degraded. Both are strictly moral and virtuous in all their relations. Crime among them is almost unknown, and the vices of civilized cities would be revolting in the highest degree to either Boer or native. The British idea is to civilize the native — to place him on an equal footing with the white man. Now you, who know something of the character and difficulty of dealing with the Indians, know somewhat the impracticability of this idea. We must remember that while the Boers have always lived among the natives, the English govern them at a distance of 8,000 miles.

Those who have studied the subject and devoted time to this work have declared that the natives cannot be civilized but in the course of events. Were the English civilized in our generation? Most emphatically, no. If some of the ancient fathers of the Anglo-Saxon race could be spirited back to earth to-day, I venture to say they would compare unfavorably with the raw native, and, if unfavorably with him, how much more so with their ultra-refined descendants of the present day? However, we can prove, without their presence, that civilization has been a very long process, each generation undergoing a separate process, until the result is attained. History is the best exponent of this. The natives, like children, are more susceptible to example than precept, and, under good example, they improve rapidly. Do not suppose that I am opposed to civilizing the native. By no means. But the great question for the moralist to solve is this: How are we to civilize them in order that they, while reaping the benefits of civilization, may retain their native virtues and moral qualities? Though vice reaps in the end its own punishment, yet would it not be better that it did not exist? Now, we notice often among a civilized people that vice comes so easy, they follow it for that very reason. But among the natives a crime or vicious propensity to do evil has been deemed worthy the severest punishment, and they regard it therefore so clearly an impossibility that they have no inclination to commit it. The result is, as I before said, crime among them is almost unknown.

Sympathy for the natives is thrown away; they are so happy and contented that you would be more inclined to envy them; they have all their needs require and to spare; they live with great simplicity; they are burdened with no more clothing than a *mucha*, which encircles the loins; their bed consists of a mat laid on the hard floor, with a piece of wood for a pillow, and a blanket or skin to cover them; their diet is entirely a vegetable one. Meat is a rare treat to them, and they can consume an enormous quantity of it; their habits are cleanly — hence, I suppose, the reason that sickness or disease is almost unknown among them; the interiors of their huts are generally neat and orderly; after eating their invariable custom is to rinse their teeth with a little clean water; their teeth are mostly dazzling white, and seldom or never decay. Polygamy is practiced by all native tribes; they generally buy a woman, subject to her consent, paying to her father the price in cows. The price ranges from ten to thirty cows for a woman, fine, fat-looking girls being

the most costly. Before a girl is married she is not allowed to work hard, or over-exert herself, as this would lessen her value in the matrimonial market; but after marriage, she must hoe the ground and plant corn and fetch wood and water and cook, and perform such other labor as their customs dictate. The most powerful native tribe in South Africa is the Zulu, lying south-east of the South African Republic. This tribe numbers about 40,000 warriors. They are a brave and intelligent race; in figure they are very erect and finely formed. The natives of the British colony of Natal, among whom many missionaries from this country are laboring, are refugees from this tribe, and many others who have settled in that country under British protection. But to return to the Boers.

Before I knew anything of the Boers — my childhood having been spent chiefly in Natal — I believed them to be a cowardly and despicable race. Since then my lot has been cast among them; I have mingled with them in their homes and partaken of their hospitality, and I need scarcely tell you that my impression is now entirely different. Their cowardice is more want of discipline than anything else; their brave old fathers spent their best years in fighting that their children might have peace, and practice disciplined them; and it is for want of this practice their children are bad soldiers. Though the Boers have simple habits and few wants, you must not imagine them to be poor. Many of them are very rich, possessing countless herds of cattle and flocks of sheep, and there are many of them whose wool brings them in a very good income. In their homes the Boers are very hospitable, never refusing to entertain the stranger. Their bearing is very independent, and they are so thoroughly above toadyism as to be able to treat all men alike without fear or favor; if a free and friendly disposition is shown, they respond with much cordiality, and evince a good feeling which is truly pleasing. They are very fond of music and dancing, and many of them play with much taste on the violin and concertina. This they acquire by ear; their dancing is chiefly confined to reels, and at New Year, when they assemble in great numbers at different houses, they keep up this dancing for two or three consecutive days, not even resting at night. In appearance the men are mostly big, with square, massive frames. They are slow and easy-going, and do not often display much activity, except in driving their ox-teams, when they jump on and off, and about their wagons, in a wonderful manner, cracking the whip, and shouting to the oxen, each one being called by a separate name. The Dutch are

proverbially slow, and yet it is astonishing how much work they get through. They must be silent workers, for in South Africa they have done all the hard work which has made it a country fit for civilized man to live in; yet they have no regular system of going to work, but follow their own inclinations entirely in this matter; considering this, they are moderately industrious. They smoke continually, and grow their own tobacco. They are very temperate, though they sometimes indulge in a brandy they make from the peach. In the winter many of them spend much time hunting the wild game, which is in droves of countless thousands. Their principal object is the skins, which form quite an article of export from the republic. They dry as much of the flesh as they care for, and the rest is left as food for the vultures, who descend like mighty armies to devour it.

Some of the Boer girls are very pretty, and their complexions are more beautiful than the best art ever invented. As the women grow older they often become enormously fat, in consequence of their inactive life. They sit a great deal, and consume untold quantities of coffee. There is always warm coffee at a Boer house, and it is kept on the table beside the good wife, who assists the guests without rising. Their custom is to serve the man first. The Boers live together in great harmony, and they show one another much respect, the youngers addressing men older than themselves as *Oom*, which answers to "uncle," and women as *Tante*, which is equivalent to "aunt." In their intercourse they are never familiar. Whole families, married, will live together in one house, or close together, and jealousy and bickering are unheard of. If a young man feels inclined to marry — which they usually do at the ages of sixteen, seventeen and eighteen years — he does not consult his purse, for he can do so without a cent, for the young couple can live with the parents of one or the other. In novels people usually marry for love — in every-day life for money. I do not know how much of love there is in a Boer marriage, but I do know that there is often very little money in it; so all the matrimonially disposed young man has to do is to decide on the object of his choice, and some fine Saturday afternoon we will see him arrayed in his best, and prancing along on a fine steed in the direction of the beloved one's home. His intentions are at once understood, and a repulse is seldom met with, for a Boer girl scarcely deems herself privileged to say "No." Much courting is not allowed, and after a few Saturday evenings, when a certain length of candle

is allowed the young couple, the marriage takes place, and they settle down to ordinary every-day life. Many of the Boer men prove themselves to be clear-headed politicians, but they are not intolerant, and are very decided in their ideas of justice. Some of the women show themselves to have a great taste for art; they make feather flowers, paint their walls with differently colored clays to resemble paper, and draw with considerable artistic skill. Their subjects are quite original and very fanciful — for instance, a man riding on an ostrich. Recent measures have been introduced for the establishment of schools among them: and while in Europe, President Burgers, of the South African Republic, secured the services of some of the most learned professors in Holland to aid in this great work. The tolerance shown to all religious denominations is one of the best evidences of the progressive spirit of the republic. And not only in this have they shown great liberality of sentiment, but they have shown the true greatness of their *independence* in the freedom with which they have admitted foreigners to all the privileges of their country, and allowed them to share in its benefits; and if on this account only, their government is worthy to be upheld and respected.

The South African Republic embraces an immense area of country, extending, as nearly as the estimate is known, from 22° to 28° S. latitude, and from 26° to 32° E. longitude; its altitude ranges from three to eight thousand feet above the level of the sea; the climate is one of the healthiest in the world — a clear, bracing atmosphere, which it is life and health to breathe. The aspect of the country varies — some parts being endless continuations of flats, and others mountainous and well wooded. For agriculture the climate and soil are peculiarly adapted; more is produced there with less labor than any other country I know of. Grain of all descriptions is successfully cultivated, such as wheat, barley, corn, rice, rye, oats, millet — wheat from that country having been awarded the prize at the Paris exhibition of 1867. All varieties of fruits of semi-tropical and temperate climates are produced, but the most abundant are peaches, apples, figs, pears, quinces, bananas, guavas, oranges and lemons. The vine grows luxuriantly, and in some instances is cultivated for the purpose of making wine. Vegetables are produced in great abundance, and grow almost spontaneously. When we see what the rude industry of the Boer has accomplished, unassisted by the implements of modern civilization — the smiling crops and luxuriant fruit-gardens which adorn his humble homestead — it is a fact which

asserts itself, that the influx of a stirring population would turn the mountains and plains of the South African Republic into a land flowing with milk and honey, and repay the laborers not ten-fold, but a hundred-fold.

At the close of the address, a vote of thanks to Miss Russell was unanimously passed.

APPENDIX TO PAPER ON SOUTH AFRICAN REPUBLICS.

Pretoria, the capital of the South African Republic, is the seat of government and the presidential residence; it is situated under the Magaliesberg mountains, on the Aapies (Apes) river, a small tributary running north and emptying itself into the Limpopo. From its central position Pretoria commands the principal trade of the country; it is the point of culmination and the center of divergence; and at certain seasons of the year there are merchants there who do a business which would not disgrace a New York merchant. The population of Pretoria would not exceed 1,000; but there is a tide of traffic through the place which gives life and animation to it. The English element is very perceptible in this town, but Dutch customs to a great extent prevail. There is much sociality and a general disposition to be hospitable and charitable. There is no lack of amusement, though it depends entirely on the people themselves to provide it. A literary and scientific institution and a musical and dramatic society give their regular entertainments, and talent and cultivation do not lack to render them successful. The ladies of Pretoria contribute in no small degree to the popularity of these meetings; in fact, they may be called indeed a community of workers; they have a reputation in South Africa for their energy and zeal in promoting good and progress; they form a society which would grace any country. It would seem strange to a traveler from crowded cities to light on rural Pretoria, and yet to find a society that charmed Mr. Froude, and to see the evidences of a prosperity eminently cosmopolitan. Pretoria boasts five churches, of different denominations; and though they are not in any way remarkable for their architecture, they are exceedingly neat and commodious, and command good congregations. To the north of Pretoria the climate and aspect gradually vary — the climate becomes warmer, the country more broken and mountainous, and trees stretch their course up steep mountain

sides and stud the valleys; birds of rich and varied plumage twitter and trill from tree to tree, and their nests hang high above you in graceful profusion; while small salt lakes deep down in mountainous basins, with trees stretching from margin to summit, add picturesqueness to the scenery, and are useful to man. The salt from these lakes, which is taken out from the bottom in huge crystallized masses, when refined is equal to Liverpool salt of the best quality. In this same region, too, there are boiling springs and medicinal springs, where annually resort many of the Boers who are afflicted or suffering with any kind of ailment or disease. This tract of country produces many rich fruits, and cotton, coffee and sugar grow admirably, though the culture of these productions has not been on a very large scale.

There are numerous other towns in the republic, each having their separate points of interest. The principal business done in these towns is that of the merchants and storekeepers, who live by trading with the Boers for their wool, skins, ivory and feathers and other produce, which they export to the British colonies. Many of these merchants have very handsome places of business, and do a thriving trade on a most extensive scale.

A DISCOURSE ON THE PHILOSOPHY OF THE NORTH AMERICAN INDIANS.

By Major J. W. Powell,
U. S. Geologist in charge of Geographical Survey of the Rocky Mountain Region.

I tell a riddle. There is an unknown known, and there is a known unknown; and I tell the answer. The unknown known is the philosophy of savagery; the known unknown is the philosophy of civilization. In those stages of culture that we call savagery and barbarism, all things are known — supposed to be known; but when at last something is known, understood, explained, then to those who have that knowledge in full comprehension, all other things become unknown. Then is ushered in the era of investigation and discovery; then science is born; then is the beginning of civilization. The philosophy of savagery is complete; the philosophy of civilization fragmentary. Ye men of science, ye wise fools, ye have discovered the law of gravity, but ye cannot tell what gravity is. But savagery has a cause and a method for all things; nothing is left unexplained.

In the lower stages of savagery the cosmos is bounded by the great plain of land and sea on which we tread, and the firmament, the azure surface above, set with brilliants; and beyond is an abyss of — nothing. Within these bounds all things are known, all things are explained; there are no mysteries but the whims of the gods. But when the plain on which we tread becomes a portion of the surface of a great globe, and the domed firmament becomes the heavens, stretching beyond Alcyone and Sirius, with this enlargement of the realm of philosophy, the verity of philosophy is questioned. The savage is a positive man; the scientist is a doubting man. And so we come back to our riddle; there is an unknown known, and there is a known unknown. But no more of riddles.

Savagery is Ethnic Childhood.

The opinions of a savage people are childish. Society grows! Some say society develops; others that society evolves; but some-

how I like to say it *grows*. The history of the discovery of growth is a large part of the history of human culture. That individuals grow, that the child grows to be a man, the colt a horse, the scion a tree, is easily recognized, though with unassisted eye the processes of growth are not discovered. But that races grow — races of men, races of animals, races of plants, races or groups of worlds — is a very late discovery, and still all of us do not grasp so great a thought.

Consider that stage of culture where growth of individuals is not fully recognized. That stage is savagery. To-day the native races of North America are agitated by discussions over that great philosophic question, "Do the trees grow or were they created?" That the grass grows they admit, but the orthodox philosophers stoutly assert that the forest pines and the great sequoias were created as they are. Thus in savagery the philosophers dispute over the immediate creation or development of individuals; in civilization over the immediate creation or development of races. I know of no single fact that better illustrates the wide difference between these two stages of culture. But let us look for other terms of comparison. The scalping scene is no more the true picture of savagery than the bayonet charge of civilization. Savagery is sylvan life. Contrast Ka-ni-ga with New York. Ka-ni-ga is an Indian village in the Rocky Mountains. New York is, well — New York. The home in the forest is a shelter of boughs; the home in New York is a palace of granite. The dwellers in Ka-ni-ga are clothed in the skins of animals, rudely tanned, rudely wrought, and colored with daubs of clay. For the garments of New York, flocks are tended, fields are cultivated, ships sail on the sea, and men dig in the mountains for dye stuffs stored in the rocks. The industries of Ka-ni-ga employ stone knives, bone awls and human muscle; the industries of New York employ the tools of the trades, the machinery of the manufactories, and the power of the sun — for water power is but sunshine, and the coal mine is but a pot of pickled sunbeams.

Even the nursery rhymes are in contrast; the prattler in New York says:

> "Daffydowndilly
> Has come up to town,
> With a green petticoat
> And a blue gown;"

but in savagery the outer and nether garments are not yet differentiated. And more: blue and green are not differentiated, for the Indian sees but one color, and has but one name; the green grass

and the blue heavens are of the same hue to the Indian eye. But the nursery tales of Ka-ni-ga are of the animals, for the savages associate with the animals on terms of recognized equality; and this is what the prattler in Ka-ni-ga says:

"The little red ant
That lives under the hill,
The little red ant
That lives under the hill,
Has only one arrow
In his quiver."

The arts and industries of savagery and civilization are not in greater contrast than their philosophy. To fully present to you the condition of savagery, as illustrated in their philosophy, three obstacles appear. After all the years I have spent among the Indians in their mountain villages, I am not certain that I have sufficiently divorced myself from the thoughts and ways of civilization to properly appreciate their childish beliefs. The second obstacle subsists in your own knowledge of the methods and powers of nature, and the ways of civilized society; and when I attempt to tell you what an Indian thinks, I fear you will never fully forget what you know, and thus you will be led to give too deep a meaning to a savage explanation; or, on the other hand, contrasting an Indian concept with your own, the manifest absurdity will sound to you as an idle tale too simple to deserve mention, or too false to deserve credence. The third difficulty lies in the attempt to put savage thoughts into civilized language; our words are so full of meaning, carry with them so many great thoughts and collateral ideas. In English I say "wind," and you think of atmosphere in revolution with the earth, heated at the tropics and cooled at the poles, and set into great currents that are diverted from their courses in passing back and forth from tropical to polar regions; you think of ten thousand complicating conditions by which local currents are produced, and the word suggests all the lore of the weather bureau — that great triumph of American science. But I say *neir* to a savage, and he thinks of a great monster, a breathing beast beyond the mountains of the west.

I speak of meteors, and you think of these wanderers of space finding rest at last on the bosom of mother earth. I say *kwechupputsiv* to a savage, and he thinks of the excrement of dirty little star-gods.

We must, if we would fully understand Indian philosophy, leave that realm of thought where the sun is a great orb swinging in

circles through the heavens, where the winds drift in obedience to cosmic laws, where falling stars reveal the constitution of the heavens, and go to that lower realm where the sun is but a little beast cowed by the heroic mien of a rabbit, and, in very fear, compelled to travel along in an appointed trail through the firmament, like an ass in a treadmill; where the wind is but breath, foul or fair, ejected from the belly of a monster; and where the falling star is but dung.

In treating of savage philosophy, I shall speak of their cosmology, theology, religion and mythology.

Cosmology.

Systems of Worlds.— Their cosmology is not always cosmogony. Some of the objects in the universe are supposed to have had an origin — to have been created; but many others to have had everlasting existence. They are accepted as facts or existences without origin — primary concepts, if you please.

A savage philosopher believes in a system of worlds, not globes swinging in the heavens, but places of existence — the world of this life, the land on which we tread and the water in which we swim — and the world or worlds of land and water to which we go. Among the different tribes of North America, two methods in the arrangement of worlds are observed. The lower tribes have their worlds all arranged horizontally or topographically; Nu-gun-tu-wip, the ghost land, the land of the hereafter, is beyond some great topographic feature. The coast tribes say "beyond the sea;" the dweller on the river banks, "beyond the river;" tribes who dwell in valleys surrounded by crags and peaks say, "beyond the mountains;" the tribes who dwell on the brinks of the great canons, "beyond the chasm." Among those tribes having their worlds arranged topographically, a past world is not an item in their philosophy; with some the progenitors of the human race, with all the animal races, came from the ground, where they burrowed in miserable existence. With other tribes the progenitors of the human race, with the races of animals, came from the depths of the sea. There are always two future worlds — one for the good, one for the bad — a land of joy and a land of sorrow.

When the future world is "beyond the chasm," the way is by a magical bridge; when "beyond the mountains," by a dangerous pass among the rocks; when "beyond the river," or "beyond the sea," a ferry is provided.

Among the higher tribes, we find the worlds arranged vertically, or architecturally; a world or worlds below — a world or worlds above. In this higher stage of savagery there is also a past world; that is, humanity came to this existence from a former, another land. Sometimes this previous land is above, sometimes below. But the land to which the righteous man goes is always in a direction opposite to that from which he came.

Thus among the Pueblo Indians there are seven worlds — one world below this and five above. We came from the world below by a magical ladder held by Ma-chi-to, one of their hero gods, who had previously discovered a hole in the sky from that lower world — the floor of this world, the sky of the lower. The souls of the newly born have escaped from below to be clothed with bodies here, and the souls of the righteous shall go on from world to world until the bliss of the seventh heaven is reached.

I must content myself with this brief account of the worlds of savagery, though the theme is attractive by reason of the many wonderful myths told of these worlds.

The Heavenly Bodies.—The sun and moon are always personages; with nomadic tribes primordial personages, uncreated personages, but slaves compelled to travel in appointed ways. They have been subjugated. The freedom to roam at will is a franchise dear to the sylvan man. What a wearied existence those shining beasts of the firmament must have, to travel in the same trail, in monotonous regularity, day by day through long years! With the Pueblo tribes the sun and the moon are personages created for a purpose — to give light and warmth.

The stars of the nomads are human beings or animals translated from the earth to the firmament for various reasons; but the stars of the Pueblos were created from the fragments remaining when the moon was made.

Meteorologic Phenomena.—Indian cosmology also deals with all the meteorologic phenomena. The aurora is the dancing of ghosts; the rainbow is made of the tears of the eagle god; the thunder is the screaming of a great bird; the lightning is the arrow of Ta-vwots, the hare god. Rain and snow are variously explained. Among the Pueblos the rain-god dips his brush, made from the feathers of the birds of heaven, into the lakes of the skies, and sprinkles the water therefrom over the face of this world. In winter time he breaks the ice of the lakes and scatters ice-dust over the earth.

Geographic Phenomena.—Their cosmology explains the origin of mountains; each mountain had a special creation; the shapes of all the storm-carved rocks were determined by the gods; the great bends of the rivers were fixed; the lakes were made, and the springs had a miraculous beginning.

Remarkable Facts in Nature.—Their cosmology also deals with all the curious minutiæ of nature. It explains the tawny patch of fur on the shoulder of the little rabbit, the cardinal head of the woodpecker, the top-knot of the crested jay, and the rattle of the serpent. So there is nothing seen that is not explained.

Important Facts of Human Society.—In like manner all the more important facts observed by them in human society, all the institutions, and all the habits and customs, have their origin, and were determined, by the gods. Every tribe has its Babel myth, its explanation of the dispersion of the human family over the earth, and the diversity of tongues. They tell when birth and death began, and when marriage was instituted.

Let me repeat a passage from a myth. It is a dialogue between two gods, the Shin-au-av brothers, the wolf-gods.

THE SHIN-AU-AV BROTHERS DISCUSS MATTERS OF IMPORTANCE TO THE PEOPLE.

Once upon a time the Shin-au-av brothers met to consult about the destiny of the Nu-mas. At this meeting the younger said: "Brother, how shall these people obtain their food? Let us devise some good plan for them. I was thinking about it all night, but could not see what would be best, and when the dawn came into the sky I went to a mountain and sat on its summit, and thought a long time; and now I can tell you a good plan by which they can live. Listen to your younger brother. Look at these pine trees; their nuts are sweet; and there is the *us*, very rich; and there is the apple of the cactus, full of juice; on the plain you see the sunflower, bearing many seeds — they will be good for the nation. Let them have all these things for their food, and when they have gathered a store they shall put them in the ground, or hide them in the rocks, and when they return they shall find abundance, and having taken of them as they may need shall go on, and yet when they return a second time there shall still be plenty; and though they return many times, as long as they live the store shall never fail; and thus they will be supplied with abundance of food without toil." "Not so," said the

elder brother, "for then will the people, idle and worthless, and having no labor to perform, engage in quarrels, and fighting will ensue, and they will destroy each other, and the people will be lost to the earth; they must work for all they receive." Then the younger brother answered not, but went away sorrowing.

The next day he met the elder brother and accosted him thus: "Brother, your words were wise; let the Ute people work for their food. But how shall they be furnished with honey-dew? I have thought all night about this, and when the dawn came into the sky I sat on the summit of the mountain and did think, and now I will tell you how to give them honey-dew: Let it fall like a great snow upon the rocks, and the women shall go early in the morning and gather all they may desire, and they shall be glad." "No," replied the elder brother, "it will not be good, my little brother, for them to have much and find it without toil; for they will deem it of no more value than dung, and what we give them for their pleasure will only be wasted. In the night it shall fall in small drops on the reeds, which they shall gather and beat with clubs, and then will it taste very sweet, and having but little they will prize it the more." And the younger brother went away sorrowing, but returned the next day and said: "My brother, your words are wise; let the women gather the honey-dew with much toil, by beating the reeds."

"Brother, when one of the men or women, or a boy or a girl, or a little one dies, where shall they go? I have thought all night about this, and when the dawn came into the sky I sat on the top of the mountain and did think. Let me tell you what to do: When a man dies, send him back when the morning returns, and then will all his friends rejoice." "Not so," said the elder; "the dead shall return no more." The little brother answered him not, but bending his head in sorrow went away.

One day the younger Shin-au-av was walking in the forest, and saw his brother's son at play, and taking an arrow from his quiver slew the boy, and when he returned he did not mention what he had done. The father supposed that his boy was lost, and wandered around in the woods for many days, and at last found the dead child, and mourned his loss for a long time.

One day the younger Shin-au-av said to the elder: "You made the law that the dead should never return. I am glad that you were the first to suffer." Then the elder knew that the younger had killed his child, and he was very angry and sought to destroy him, and as

his wrath increased the earth rocked, subterraneous groanings were heard, darkness came on, fierce storms raged, lightning flashed, thunder reverberated through the heavens, and the younger brother fled in great terror to his father Ta-vwots for protection.

Theology.

I next speak of their theology — their system of gods. The theology of the North American Indians is not fetichistic, though there are many survivals from fetichism.

Beast-Gods.— All of the nomadic tribes are zoöloters; their gods are animals.

The savage, the sylvan man, as the word signifies, is intimately associated with the animals with which he is surrounded. From them he obtains the larger part of his clothing, and much of his food, and he carefully studies their habits and finds out many wonderful things. Their knowledge and skill and power appear to him to be superior to his own. He sees the mountain-sheep fleet among the crags, the eagle soaring in the heavens, the humming bird poised over its blossom-cup of nectar, the serpent swift without legs, the salmon scaling the rapids, the spider weaving its gossamer web, the ant building a play-house mountain. In all animal nature he sees things too wonderful for him, and from admiration he grows to adoration, and the animals become his gods.

Another trait of character comes in to modify his theologic beliefs — I mean ancientism — veneration for the past and for the people of the past. This is a very common trait in human nature. You know there are no great men living; all the wise are dead; all the good are dead; and the men of the present are their degenerate sons. But this ancientism is much more highly developed in the savage. Everywhere the sylvan man mourns the days that are lost, the men who are gone. The burthen of every homily in an Indian camp is the degeneracy of the present time; the theme of every eulogy, the wisdom and virtue of the ancients. This ancientism appears in their theology in a very interesting manner, for it is not the animals of to-day whom they worship, but the dead animals — the ancient animals — the progenitors or prototypes of the present. Individuals of every species are supposed to have descended from the more ancient animal, the progenitor of the race, who was a wonderful being. The wolf of to-day is a howling pest, but that wolf's grandfather was a god. And so they have a grizzly-bear-god, an eagle-

god, a rattlesnake-god, a trout-god, and a spider-god — a god for every race or species of animal.

Hero-Gods.—There is another very curious and interesting fact in Indian philosophy. They do not separate man from the beast by any broad line of demarkation. Mankind is supposed simply to be one of the many races of animals; in some respects superior, in many others inferior, to those races. So the Indian speaks of "our race" as of the same rank with the bear race, the wolf race, or the rattlesnake race; and, as he deifies ancient beasts, he deifies ancient men, and thus he has a special class, which we may denominate hero-gods. Some of the earlier men and women of the human race were wonderful people, and performed many great deeds.

Daimon-Gods.—I have said that the theology of the North American Indians was not fetichistic, but among them we find many survivals from fetichism; and one of these is a survival by special development — I mean their daimon-gods. I use the term *daimon* rather than *demon*, for the latter has a Christian meaning of "devil," while these daimons are simply the presiding spirits of places. Thus they have the spirit or ghost of the mountain, the spirit of the river, the spirit of the lake, the spirit of the spring, the god of the east, the god of the west, the god of the north; and the god of the south, whose breath makes the winds.

It must be understood that these daimons have animal forms, but have the power of transforming themselves and assuming any shape at will, anthropomorphic or zoömorphic. This is true also of the beast-gods. They can transform themselves, and many wonderful stories are told in their mythology of such transformations. Their hero-gods also have the power of transformation, and may be anthropomorphic or zoömorphic. So their daimon-gods are animals.

Firmament-Gods. — The sun, moon and stars are also gods, and do many wonderful things, though they are not usually held in very high esteem. This gives us a class which I call firmament-gods. They are also animals, and can at will transform themselves, taking the shape of men or beasts.

So all their gods are animals, and the form in which they may appear at any time is a matter of momentary whim; and these animal gods may be classed, as you will see, as firmament-gods, hero-gods, beast-gods and daimon-gods. There are two general facts concerning the gods of the Indians, which must be emphasized. First, they are zoömorphic — they are animals; and second, they are all

ancient people. In most Indian languages the generic term for god is "ancient." In the Numa or Shoshoni language it is *e-nu-ints-i-gaip*, "ancient persons," and the equivalent of this word is found in many other languages; and there is a special declension of nouns and adjectives, and a special conjugation of verbs, used in speaking of the ancients — the gods — giving to these languages a solemn, reverential style.

Monster-Gods. — A vicious human trait, exaggeration, plays some strange freaks in Indian theology, and often their gods become monsters — beasts with seven heads and ten horns. There are three conditions favorable to the development of these monster-gods. The first is the migration of a tribe to a land where a new fauna is found. In such migration they carry with them their gods; but no longer having the animal descendants of their gods in presence to correct their descriptions and to keep them within bounds, all the important characteristics of their ancient gods steadily develop; horns are multiplied; tails are lengthened; claws grow; eyes enlarge or multiply; wings stretch out like the clouds; the serpents that could twine about a bough grow until they can twine about a mountain. The second method by which monsters are produced is in some respects like to the first, but the myth, only, travels from tribe to tribe, and it is often very difficult for us to determine whether the myth alone has traveled or not. The third class of monsters are those based on the great bones discovered — bones of extinct elephants and mastodons. With some of the tribes these mythical monsters are very important personages.

Tutelar Gods. — Avarice plays a very important part in Indian theology. The Indian has but a small store of material things, and the religious element greatly prevails in his life; and his desire for possession — ownership — is very strong; so every Indian selects a tutelar god — a "my god." Families also have tutelar gods, and so do clans and tribes. Now the clan is a wide-spread institution among North American Indians, the nature of which is so well known that I need not stop to explain it; but the tutelar god of a clan comes to be a very conspicuous personage, and his image, as a rude painting or carving, is taken as the badge of a clan, and this tutelar god gives name to the clan; it is the *totem*.

Such are the gods of the nomads of North America; firmament-gods, which are animals; hero-gods, animals also, as man is an animal; beast-gods, the progenitors or prototypes of the present races

of animals; and daimon-gods, presiding spirits of places, also zoömorphic.

In studying the myths of North American Indians, many have sought to evade this conclusion; and one of our brilliant writers on the myths of the new world exclaims: "Man, the paragon of animals, praying to the beast, is a spectacle so humiliating that, for the sake of our common humanity, we may seek the explanation of it least degrading to the dignity of our race."

There have been many curious ways of interpreting Indian myths. The latest and most attractive is that by which they are converted into wonderful symbols, so that whenever an Indian calls his god *wolf*, he does not mean "wolf," he means "wind," for the wind howls and the wolves howl; when he says *serpent*, he does not mean "serpent," he means "lightning," for the serpent darts and the lightning darts. Now, that such symbolism has existed among people whose grades of culture is higher, cannot be denied. The fact of general nature-worship by the ancient Indo-European people is fully established, and in many ways and by divers methods a wonderful system of symbols grew up among these earlier Aryans. This nature-worship was the personification and deification of the forces and phenomena of nature. The later Greek and Roman philosophy was a personification and deification of human attributes, passions and sentiments. But in this later theology, vestiges of the earlier nature-gods are discovered. So, too, in the ancient Indo-European or Aryan nature-worship, vestiges of an earlier theology appear, and that earlier theology was a deification of animals, a theology still extant among the North American nomads; and in this last-mentioned system the vestiges of one still more primitive appear, for in it relics of fetichism are found. Indian theology is not a degeneracy from monotheism. It is not a degeneracy from that polytheism prevailing among classical nations, where human attributes were deified. It is not a degeneracy from that earlier polytheism where the forces and phenomena of nature were deified. The Indian gods are animal-gods, and the Indian religion, zoölatry — a development from fetichism.

The literature of North American ethnography is vast, and scattered through it is a great mass of facts pertaining to Indian theology, a mass of nonsense, a mass of incoherent folly, whenever those facts are looked upon from that standpoint which assumes that Indian theology is a degeneracy from some higher type; but when accepted as it is understood by the Indian himself, the great multitude of facts

fall into place and assume the form of a theological organism, ethically a hideous monster of lies, but ethnographically a system of great interest — a system which beautifully reveals the mental condition of savagery.

I have no time to dwell on the theology of the Pueblo Indians, but simply to say that a mixture of nature and animal worship exists among them, so that they may be considered as in a transition state.

Religion.

I come now to speak of Indian religion, and by religion I mean the relations existing between gods and men; for religion chiefly has to do with the avenues to deity — the means of communication, the means of influencing the gods. In Indian philosophy the gods are not very far from us in intrinsic nature. They are poor brutes like ourselves, with like passions and like prejudices; quick to anger and of generous impulse; revengeful to enemy and faithful to friend. In many respects they have no greater powers than ourselves, and none of them have greater power than the ancients. The gods *are* the ancients. Our inferiority is due to our late degeneracy. The gods can transform themselves; the gods may wander through the universe untrammeled by bodies, and the gods can do many other wonderful things. And so did we a few generations ago; we also were gods, but now we are burdened with a curse. We can talk to the gods and they can hear and understand, but when they talk to us our ears are closed for we have forgotten the ancient language. Yet they speak to us by signs and wonders in the heavens, and the groves resound with their voices; ever they are signaling to us; they appear to us in dreams by night, and when our minds are free from incumbrance of natural things they come to us in visions by day.

Priest-craft. — But only to the few are these revelations vouchsafed, and thus it is that priest-craft is specialized. Certain persons only can communicate with the gods. Three somewhat distinct classes of priests are found among all North American Indians, prophets, shamins and witches, giving rise to prophet-craft, shamin-craft and witch-craft.

Prophets. — The prophets are the great men who rise from time to time among the tribes, men to whom the gods reveal their will concerning the destiny of the people. All of the great movements among Indian nations are inaugurated by the prophets, whose warnings are awful, whose denunciations are terrible, and whose promises

are full of bliss. Pontiac was a great prophet, and faith in him was the power by which he was enabled to organize the great Indian conspiracy. The invisible bond that held together the confederacy of forest tribes scattered from the Alleghanies to the Mississippi, and from the great lakes to the Tennessee, was the prophesies of that great chief Tecumseh. In later times, only a few years ago, within my own knowledge, a powerful and revered chief of the Pan-a-mints of western Nevada retired from his tribe and made his home among the crags of that great mountain San Bernadino. From time to time he came down among his people to preach, then again retired to dwell in his lonely home among the clouds. And his fame spread among all the Indians in the country round about. At last the years of his seclusion ended, and he set out on a pilgrimage, his mission being to tell all the people what the gods had revealed to him while he dwelt alone. The tribes of the western slope of the Sierras met him in Tulare valley and there was a great revival, the meaning of which no white man can find out. The tribes of the deserts in southern Nevada, southern Utah and southern California, met him at the foot of Nu-a'-gunt, a great mountain near the Vegas. The tribes of northern Utah, Colorado and southern Idaho met him in Utah valley. I was, myself, present at that meeting, but learned nothing of the revelations made by the great prophet A-vwat'-si-vwav or White Cloud, but I have seen its effect in a wide-spread revival of all the ancient dances and ceremonies, and A-vwat'-si-vwav seems to have been a prophet of peace. But usually prophets are great leaders in war.

Shamins.—The shamins are priests of a lower grade, and are usually known among white people as medicine-men. They take charge of the religious ceremonies, and practice sorcery in divers ways. One of the most important of their offices is the driving out of evil spirits. Among the Indians a disease is not supposed to be an improper working of the functions of the system, but is an entity, an evil spirit, a devil which takes possession of some part of the person and must be exorcised. The Indian therapeutic system is sorcery.

These shamins or medicine-men have great influence among the Indians, and often aspire to become prophets.

Witches.—The third and lowest grade of priests I call witches. This craft is carried on chiefly by women, though occasionally men are accused of being wizards, for witch-craft is the practice of sorcery for evil purposes. There is a very general belief that old women

unless they die at a reasonable time, are transformed into witches, and are finally carried away by whirlwinds.

Ecstasism. — The means by which prophets, shamins and witches carry on their mysterious professions are various and of great interest; chief among these is the practice of ecstasism. This is the production of an ecstatic state, a physical condition bordering on epilepsy. One of the most common methods of producing ecstasy is by fasting, another by the use of the decoction from plants, black drinks as they are usually called. Often it is by long-continued sweating and fasting and the use of black drinks. The sweat-house is a universal institution among North American Indians. It is often an underground compartment; sometimes it is built of boughs or skins like an ordinary lodge, and is properly a general assembly-chamber for council, for religious ceremonies and for convivial occasions and general gossip. These council-chambers are also sometimes used as sweat-houses, and by long-continued fasting, sweating and the use of black drinks the prophets and shamins are able to bring themselves into a most wonderful condition of ecstasy, so that their ghosts or spirits are untrammeled by their bodies and they can talk with the gods and peer into the future.

With many tribes every boy, on coming to the age of puberty, goes to the top of some mountain, to the depths of some forest, or out into the desert to fast, and remains until it is revealed to him whom he shall take for his tutelar god; and often during these conditions of ecstasy he receives revelations which largely govern his subsequent life, for the revelations of that awful hour are held most sacred. The maid, too, is initiated into the mysteries of womanhood by like practices.

Amuletism. — Among many of the religious ceremonies that prevail I must not fail to mention amuletism. This is probably a relic from fetichism, though it widely prevails in that state of religion of which we are now speaking. But amulets are not gods, they are mediators. In some ecstatic state, or in some dream, or in some other mysterious manner, every Indian finds an amulet, a curious pebble, a bone, a claw, a knot of hair, which he keeps on his person to bring him good fortune, or to keep away disease-devils.

The shamins, too, are very skillful in the decoction of sorcery-broth, usually foul mixtures that are prepared prior to engaging in any important enterprise.

Many are the religious ceremonies among the Indians — sacrifice

of parts of all animals killed in the chase; prayer to the tutelar god; baptism for consecration, dancing, chanting, and a great number of peculiar ceremonies, observances and prohibitions, so that the whole daily life of an Indian is a religious life. He is a slave to religious observances of times and methods and absurd prohibitions. He may not whistle at night lest an *u-nu-pits*, an evil spirit, should enter his mouth under cover of the darkness.

But religion also has to do with admission to the land of the hereafter. Admission to the land of want is always free; the terms of admission to the land of plenty are variously and vaguely fixed. All the living righteous, who are few, will go to the latter; all the living bad, who are many, to the former. The dead, those who lived in the happy days of yore, are almost all good, and few have been denied entrance to the home of the blessed. But who are the wicked, and who are the good? The ethic standards of savagery and civilization are as widely contrasted as their ideas of meteors. The bad man is he who failed to sacrifice to his tutelar god the spleen of the last elk killed; or he slept on his back the night before the battle, when the gods have taught him to sleep on his belly. They have some very curious soulometers!

Sometimes the good land is beyond the bad, and through the latter the ghostly traveler passes in great dismay, happily reaching the former if his savage sins have been duly propitiated and the angry gods appeased; but woe to him who dies with savage guilt resting on his ghost. Sometimes there are two ways — the angry gods lead here, the appeased gods lead there.

Mythology.

And now I speak of Indian mythology. In every Indian tribe there is a great body of story lore; tales purporting to be the saying and doings, the history, of the ancients — the gods. Every tribe has one or more persons skilled in the relation of these stories — preachers. In all the Shoshoni tribes the preacher is called a *nar-i-gwi-nump*, "one who tells of the ancients." The long winter evenings are set apart for this purpose. Then the men and women, the boys and girls, gather about the camp-fire to listen to the history of the ancients, to a chapter in the unwritten Bible of savagery. Such a scene is of the deepest interest. A camp-fire of blazing pine or sage-boughs illumes a group of dusky faces intent with expectation, and the old man begins his story, talking and acting; the elders

receiving his words with reverence, while the younger persons are played upon by the actor, until they shiver with fear or dance with delight. An Indian is a great actor. The conditions of Indian life train them in natural sign-language. Among the two hundred and fifty or three hundred thousand Indians in the United States, there are scores of languages, so that often a language is spoken by only a few hundred or a few score of people; and as a means of communication between tribes speaking different languages, a sign-language has sprung up, so that an Indian is able to talk all over — with the features of his face, his hands and feet, the muscles of his body; and thus a skillful preacher talks and acts; and inspired by a theme which treats of the gods, he sways his savage audience at will. And ever as he tells his story he points a moral — the mythology, theology, religion, history and all human duties are taught. This *naru-gwi-nai*, this preaching, is one of the most important institutions of savagery. The whole body of myths current in a tribe is the sum total of their lore — their philosophy, their miraculous history, their authority for their governmental institutions, their social institutions, their habits and customs — it is their unwritten bible.

In a single lecture I cannot introduce many of these tales; one or two must suffice for illustration.

Origin of the Echo.

I'-o-wi (the turtle dove) was gathering seeds in the valley, and her little babe slept. Wearied with carrying it on her back, she laid it under the *ti-hó-pi* (sage-bush) in care of its sister O-hó-chu (the summer yellowbird). Engaged in her labors, the mother wandered away to a distance, when a *tsó-a-vwits* (witch) came and said to the little girl, "Is that your brother?" and O-hó-chu answered, "This is my sister," for she had heard that witches preferred to steal boys, and did not care for girls. Then the tsó-a-vwits was angry and chided her, saying that it was very naughty for girls to lie; and she put on a strange and horrid appearance, so that O-hó-chu was stupefied with fright, and then the tsó-a-vwits ran away with the boy, carrying him to her home on a distant mountain. Then she laid him down on the ground, and, taking hold of his right foot, she stretched the baby's leg until it was as long as that of a man, and she did the same to the other leg; then his body was elongated; she stretched his arms, and behold the baby was as large as a man. And the tsó-a-vwits married him and had a husband, which she had long desired;

but, though he had the body of a man, he had the heart of a babe, and knew no better than to marry a witch.

Now, when I'-o-wi returned and found not her babe under the ti-hó-pi, but learned from O-hó-chu that it had been stolen by a tsó-a-vwits, she was very angry, and punished her daughter very severely. Then she went in search of the babe for a long time, mourning as she went, and crying and still crying, refusing to be comforted, though all her friends joined her in the search, and promised to revenge her wrongs.

Chief among her friends was her brother Kwi-na (the eagle), who traveled far and wide over all the land until one day he heard a strange noise and coming near saw the tsó-a-vwits and U-ja (the sage-cock), her husband, but he did not know that this large man was indeed the little boy who had been stolen. Yet he returned and related to I'-o-wi what he had seen, who said: "If that is indeed my boy he will know my voice." So the mother came near to where the tsó-a-vwits and U-ja were living and climbed into a cedar tree and mourned and cried continually. Kwi-na placed himself near by on another tree to observe what effect the voice of the mother would have on U-ja, the tsó-a-vwits' husband. When he heard the cry of his mother U-ja knew the voice and said to the tsó-a-vwits, "I hear my mother, I hear my mother, I hear my mother," but she laughed at him and persuaded him to hide.

Now the tsó-a-vwits had taught U-ja to hunt, and a short time before he had killed a mountain-sheep which was lying in camp. The witch emptied the contents of the stomach and with her husband took refuge within, for she said to herself, "Surely I'-o-wi will never look in the paunch of a mountain-sheep for my husband." In this retreat they were safe for a long time, so that they who were searching were sorely puzzled at the strange disappearance. At last Kwi-na said, "They are hid somewhere in the ground, may be, or under the rocks; after a long time they will be very hungry and will search for food; I will put some in a tree so as to tempt them." So he killed a rabbit and put it on the top of a tall pine, from which he trimmed the branches and peeled the bark so that it would be very difficult to climb, and he said, "When these hungry people come out they will try to climb that tree for food and it will take much time, and while the tsó-a-vwits is thus engaged we will carry U-ja away." So they watched some days until the *tsó-a-vwits* was very hungry and her baby-hearted husband cried for food, and she came out from their

hiding place and sought for something to eat. The odor of the meat placed on the tree came to her nostrils, and she saw where it was and tried to climb up but fell back many times; and while so doing Kwi-na, who had been sitting on a rock near by and had seen from where she came, ran to the paunch which had been their house and taking the man carried him away and laid him down under the very same ti-hó-pi from which he had been stolen, and, behold, he was the same beautiful little babe that I'-o-wi had lost.

And Kwi-na went off into the sky and brought back a storm and caused the wind to blow and the rain to beat upon the ground so that his tracks were covered and the tsó-a-vwits could not follow him, but she saw lying upon the ground near by some eagle feathers and knew well who it was that had deprived her of her husband, and she said to herself, "Well, I know Kwi-na is the brother of I'-o-wi, he is a great warrior and a terrible man; I will go to To-go-a (the rattle-snake), my grandfather, who will protect me and kill my enemies."

To-go-a was enjoying his midday sleep on a rock, and as the tsó-a-vwits came near her grandfather awoke and called out to her, "Go back, go back, you are not wanted here, go back!" But she came on begging his protection, and while they were still parleying they heard Kwi-na coming and To-go-a said, "Hide, hide!" But she knew not where to hide and he opened his mouth and the tsó-a-vwits crawled into his stomach. This made To-go-a very sick and he entreated her to crawl out, but she refused for she was in great fear. Then he tried to throw her up but could not, and he was sick nigh unto death. At last, in his terrible wretchings, he crawled out of his own skin and left the tsó-a-vwits in it, and she imprisoned there rolled about and hid in the rocks. When Kwi-na came near he shouted, "Where are you, old tsó-a-vwits? where are you, old tsó-a-vwits?" She repeated his words in mockery.

Ever since that day witches have lived in snake-skins, hide among the rocks, and take great delight in repeating the words of passers by.

The white man who has lost the history of these ancient people calls these mocking cries of witches, domiciliated in snake-skins, "echoes," but the Nu-mas know the voices of the old hags.

This is the origin of the echo.

CHINA: THE COUNTRY AND PEOPLE.

By S. Wells Williams, LL. D.

Ladies and Gentlemen. — It will hardly be possible to do more, in the time which is allotted to me, than to describe, as accurately as I can, the three points which are comprised in the subjects before us,— the country and people of China, and the place this kingdom occupies among the nations of the earth.

In the first place, the position of the country may be briefly described — and before the Geographical Society this seems to be quite suitable — so that a good idea may be obtained of the land in which the Chinese now dwell. It is in most respects one of the most favored regions on the face of the earth, comprising within its limits every variety of soil and climate; watered by large rivers, which, serving not only to irrigate and drain it, but by means of their size and the course of their tributaries, also affording unusual facilities for intercommunication, it produces, within its own borders everything necessary for the support, comfort and delight of its inhabitants, who have depended very slightly upon the assistance of other climes and nations for satisfying their own wants. Its civilization has been developed under its own institutions; its government has been modeled without knowledge or reference to that of any other kingdom; its literature has borrowed nothing from the genius or research of other lands; its language is unique in its symbols, its structure, and its antiquity; and its people are remarkable for their industry, religion, peacefulness and numbers.

The Chinese empire, as you are aware, lies in the south-eastern part of Asia; and the area over which its monarch claims jurisdiction measures altogether about 5,300,000 square miles. A great part of this vast region, however, is occupied with the mighty desert of Gobi; and another large area is the unknown mountainous wilds of the Kwănlun lying north of Tibet, around the sources of the Yangtse and Yellow rivers. This is probably the largest tract of unknown land now left on the face of the earth.

But it is the country which we call China, and its inhabitants term

Chung Kwoh, or the Middle Kingdom, to which our attention and inquiries are directed when we speak of the Chinese people. This territory measures from 1,500,000 to 2,000,000 square miles, according as the northern frontiers are placed, and presents a great variety of plains and mountain ranges. It is divided into three great basins, that of the Yellow river on the north, the Yangtse in the middle, and the Pearl river in the south. All these streams and many others run generally from west to east; the greatest rivers in the United States run from north to south, and thereby experience wider changes of climate during their course.

In the north-east lies the great Plain, one of the observable features of the country, whose area is computed at 200,000 square miles; it is by far the largest in the world that can be cultivated, and by the census is reckoned to support about 177,000,000 of people. It is one of the most highly cultivated portions of the empire, and produces almost everything which is peculiar to it; two crops are annually raised from nearly every part of it. The limits reach from beyond Peking on the north to Hangchau south of the Yangtse, and extend, at various widths, from the Yellow Sea inland to the mountains of Honan and Nganhwui.

One of the most remarkable points connected with this Plain is the recent change in the course of the Yellow River, which has resulted in diverting most of its waters from their old embouchure in the Yellow Sea to the Gulf of Chihli. The rapid current brings down so much silt from the region near the great Wall that when it enters the province of Honan, there is not scour enough to carry the sediment out to sea. The final closure of the old channel took place about twenty-five years ago, by which time the waters had dug for themselves a passage to the north-east through Shautung, a small part of them going to the south-east into the grand Canal. This change is one of the most remarkable geological phenomena of modern times.

The metropolis *Peking*, a word meaning northern capital, lies on its edge, at the foot of the table-land of central Asia, and has been the capital since about A. D. 1280. It is situated about twelve miles from the Pei-ho (*i. e.* White river), and is rather larger in circuit than Manhattan island, its walls measuring nearly twenty-four miles around; it now has the finest wall of any city in the world, being nearly fifty feet high and fifty feet broad. The population is less than it was a hundred years ago, and is variously estimated at

from 800,000 to 1,000,000. During the rebellions which have occurred in China, especially the last, the city has become impoverished, and now presents a melancholy example of the degradation of an eastern capital and the depreciation of its trade and riches. It is still an interesting city, and fully maintains its power as the seat of the government.

Russia is separated from China by the great Plateau and ranges of Mongolia, measuring, without close accuracy, about a million and a half of square miles, and supporting numerous small tribes of Mongols over its steppes, the descendants of the Scythians and Huns of ancient times, and just the same nomads still. One Russian traveler has penetrated almost to the head-waters of the Yangtse river, and describes the whole country lying westward of Lake Koko-nor as a howling wilderness, where few inhabitants could be found to be taught, or even to be caught. The productive part of the Plateau is called *Tsow-ti*, or the Land of Grass, and in its better portions presents a wide, grassy plain, having no trees, shrubs, fences, fields, plowed land, houses or roads — a wide, green expanse, with a few *yourts*, or tents, of felt, and scattered flocks of sheep and camels, to relieve the monotony.

These two native maps before me represent the eighteen provinces, according to the popular notions of the Chinese, wherein nearly the whole world is supposed to be their empire, and other nations to lie on its outskirts in a miscellaneous manner. North and South America and most of Africa are omitted altogether, and room is only left for a few islands in the southern Indian seas. Yet these maps will compare very well with those of the Romans in the days of Nero; those displayed just the same ignorance of the eastern world that these do of the western. The other native map represents the city of Peking, and fairly exhibits its divisions and form; on the south are seen the inclosures within which the emperor annually worships Heaven and the God of Agriculture.

China is greatly favored in regard to climate, possessing one of the most salubrious and equable in the world. Compared with our own country, the mass of the land lies about five degrees south of similar climatic conditions here, so that Canton, which is parallel with Havana, has more resemblance to Savannah. In the north, the air is drier than on the Atlantic coast; it is modified by the Plateau, and the Pacific gulf-stream runs much more remote from the Chinese coast than the Atlantic does from our shore line, outside of the great

intervening chain of islands. Peking, which is parallel with Philadelphia, has a warmer and drier climate.

The productions of this empire suffice for the maintenance of its great population, and, with increased facilities, would support many more. It gives one a clearer idea of their numbers to learn that every blade of rice is transplanted; and all grains are sown by drilling, and not broadcast. Almost every part of the country furnishes two crops annually, and no land is laid down in grass for the grazing of cattle and sheep. In metallic riches and deposits of coal China equals any country, and Baron Richthofen assures us that the province of Shansi contains more iron and coal in its bowels than any similar area in the world.

The isolation of China, as she lies in the south-eastern part of Asia, separated on the west and north by impassable deserts and mountains, and accessible only by long voyages equally difficult in former days, has had the result of preventing other powerful kingdoms from molesting her, so that she has worked out her own civilization in her own way. In these days of steam, however, this isolation has been removed; but steam itself will prove to be a great civilizer. The internal water communications have never yet been fully utilized, and the productions of one part cannot easily reach other distant parts. Their great system of rivers still awaits the visits of small steamers, and with them will come a better degree of knowledge and mutual benefit among the people. This work has already commenced.

But far more than the country and its products, is the *Li-min*, or black-haired race, as they call themselves, the people of this ancient land, which interest us most. They form, probably, a branch of the Turanian race, and their ancestors, it is thought, came across the highlands of central Asia about six centuries after the Flood, and settled around the elbow of the Yellow river as far back as forty-eight centuries ago. Their early records are imperfect, and many points are very obscure, and susceptible of much discussion, but compare favorably with those of other ancient peoples. They indicate, even then, a painstaking, industrious, law-abiding community, reverential to their rulers, and ready to defend their rights. The present Manchu family is their twenty-fifth dynasty, and the monarch now on the throne, a child under four years of age, is the 238th sovereign, commencing with Yu the Great, B. C. 2205. Their history dates back of this, and the sexagenary cycle, by which chronology is

computed, began B. C. 2637, making the year 1876 the 4513th year of their chronology.

The position of the sovereign is peculiar, partaking partly of a religious and partly of a paternal-political character. He is often styled *Tien-tsz'*, or Son of Heaven, because he is the outcome and appointee of the two Powers, heaven and earth. Chinese cosmogony speaks of a trinity — Heaven, Earth, and Man — and he, the Emperor of China, is the representative man on earth. How this combination of heaven and earth has resulted thus, even the plastic evolution theory of the Chinese does not plainly inform us; but admitting it, they think that all mankind are bound to call him Son of Heaven, and acknowledge him to be such. With that name he arrogates to himself divine honors as the vicegerent of Heaven on earth, by right alone entitled to worship it on the great altar erected at Peking, associated with certain of his kindred and high officials deputed for this ceremony. This altar is, with other buildings and grounds, inclosed within two walls, and constructed of white marble; on the top are five stone altars like round tables, open to the sky, on which he presents sacrifices or offerings of bullocks, not to propitiate Heaven by shedding their blood, but rather to please it by burning their dead bodies. He presents them as a kind of co-ordinate, who is equal with Heaven, and worships Shangti, or the Supreme Ruler, as the highest power. So far as I know, no foreigner has witnessed these ceremonies.

A good deal of discussion has arisen respecting the nature of this ceremony. Some foreign scholars regard it as a relic of an ancient monotheistic worship of the true God, but I am inclined to look upon it as an outcome and union of the worship of deified Heaven and of ancestors, and that the term Shangti denotes and includes both, to whom divine powers are given as the tutelar deities of the imperial family.

This worship is the state religion of China, and no subject can participate in it, or vicariously perform it,— the emperor alone being the high-priest of his people before Heaven. When he is a minor there are no sacrifices, no worship. One result of this has been favorable to the welfare of China, in that no hierarchy has been constituted and grown into a body between the monarch and this object of worship. We know how disastrous to the welfare of a people has been the power of a state priesthood exercising control over them, as was the case in Egypt, and some other countries; but in the Chinese state worship, the imperial worshiper, combining in himself

the whole system, runs no risk of being supplanted by his priests, and the people have escaped their irresponsible tyranny.

The emperor has absolute power over the lives and properties of his subjects, and is supposed to govern them personally; but really he is, of course, obliged to delegate most of the duties to governors and ministers, who together form a great and powerful body of officials. The mode of choosing these men by means of competitive examinations, where the successful candidate in a lower grade alone becomes eligible to enter the tripos of the next higher, and thus advance to the highest posts in the state, is one of the institutions of China which distinguishes her from all other nations. It has done more than anything else to conserve her national character and policy, and maintain her integrity by strengthening the intellectual influence of letters, and leading her people to honor and pursue the arts of peace and industry.

The common schools are entirely free of direct government control or support, and are taught by any persons whose literary attainments and character are such as can attract scholars. The course of study throughout the land is uniform, and the stimulus to enter upon it on the minds of most people is the hope that they may attain that rank and power which others have reached, and are open to all. This incentive has proved powerful enough during the lapse of generations to raise up a great body of educated and enterprising men, who now form the gentry and literati of China — her governing aristocracy, constantly replenished from the mass of the people, and conversant with the principles on which the government of the country is carried on.

The boys enter school about the age of seven, and begin the course by learning to *read* the horn-books before they learn what they mean, as no boy can find out what a character is called till its name has been taught him. The first sentence he is taught in the Trimetrical Classic contains an assertion which has perplexed mankind in all ages, and the Chinese as much as any — that of man's moral condition. It is, "Man by nature is originally good, but by practice all become different" or bad. In these common schools, only the ancient classics, or such writings as will aid in learning them, are taught; no instruction is given in geography, natural history, astronomy, or natural philosophy; very little in mathematics or grammar; and, of course, nothing concerning the history, languages,

or condition of other lands, on which subjects they have, in fact, no school books.

After a boy has learned the classics by heart, he receives further instruction from higher teachers in composition, until he is qualified to enter the regular examination. These examinations are conducted under the direction of certain literary and civil officers, first in the district, then in the prefecture, and lastly in the provincial capital; the successful candidates in the first alone being eligible to enter the second, and in the same manner for the last. This winnowing process discourages many, for only those who have passed the last trial receive the lowest degree of *siu-tsai*, or "flowery talent." Once in three years they also are called together in the provincial capital, and undergo similar trials in essay writing to receive the next degree of *kü-jin*, or "promoted men," equivalent to our master of arts. The examination-hall at Canton, where students assemble, contains 8,653 cells, so small that the occupant can hardly stand or lie down, furnished with a stool and table, and writing implements. On entering he is searched to prevent him carrying anything into the room to help him, and no candidate knows the themes on which he is to write till he enters. Out of the whole number of candidates, only seventy-two, or less than one per cent, can by law receive the coveted honor. The time of this examination is a season of great excitement at Canton, where thousands of ambitious scholars are gathered out of every part of the province, and have the freest intercourse. I do not know that the world can show a more wearisome literary task than to look over thirty or fifty thousand essays on the same subjects, and decide on their merits. If an essay contains a miswritten character it is thrown out; and there are other defects which may lead to its rejection apart from its merits. A candidate may compete as often as he pleases, and on one occasion at Canton, a father, son and grandson appeared at the same tripos.

The third trial is held triennially at Peking, and as only a *kü-jin* can enter to compete for the *tsin-sz'* degree, the number of students does not much exceed the assemblage at Canton. At a recent examination at Peking, in addition to the 11,000 *kü-jin* who were eligible, it was estimated that nearly twice as many others, relatives and friends, assembled with them, some of them coming more than 2,000 miles. At Peking, only about 200 of the whole number can succeed, but this small proportion does not seem to irritate the under-graduates, or

dissatisfy them with the system. The successful competitors are soon rewarded with some kind of governmental employ, but those of a lower degree are eligible too.

The results of this system, since its initiation about 2,000 years ago, have been to thoroughly eradicate all traces of the feudal system, and render such a congeries of petty barons and kinglets as made Germany into a checker-board, impossible. It has also imbued the mass of people with the democratic spirit of the books which they studied at school, and learned to discuss in their essays. This spirit has enabled them to combine intelligently against oppression; and as the officials all spring from the body of the people, they, too, are not easily made the instruments in the hands of an unscrupulous monarch to destroy the sources of their own power. Besides this, the system opens a legitimate channel for the ambition, the learning and the intrigue of talented persons, who otherwise would seek to rise by destroying the institutions of the land; each can find ample scope for his greatest efforts.

This view of the competitive system by which officers are chosen among the Chinese, leads to a reference to the books studied. These are popularly ascribed to Confucius by foreign writers, and he has left the impress of his mind upon them, though he was the author of only two of the nine classics, and edited four others. This remarkable man was raised up by God to put before his countrymen those principles of morality and good government which would promote national prosperity if observed; and the system for securing official position has insured their thorough study and observance in a way that no other writings have ever had in any age. Confucius was in no sense a religious teacher like Zoroaster or Mohammed, though he upheld the state religion and ancestral worship as he found them. His aim was to restore the ancient days when good rulers had obedient subjects, and peace proved the sway of just laws. When asked about the respect owing to demons and gods, he told his disciples to give them due respect but keep them at a distance. Instead of useless speculation about the future and unseen, he inculcated regard to rulers, obedience to parents, honor to husbands, and maintenance of law. One result of this has been the absence of all discussion among his followers upon subjects beyond their reach, and great prominence given to a government for the good of the people; it has also nourished a cold scepticism destructive of all religious feeling and faith. In his day he endeavored to carry out his plans

of reform in his native state, and succeeded so far in securing the countenance of his king and the approval of his countrymen, that he raised it to a prosperity which alarmed the neighboring states, and resulted in his final dismissal. But the experiment was not lost, and his principles of equitable government for the good of rulers and ruled, were subsequently developed and urged by his disciple Mencius, one of the most thoroughgoing republicans who ever lived, and who even went beyond him in the sturdy defense of popular rights and kingly responsibility. To these two great men the Chinese owe their ideas of right rule, and the strength and prevalence of these ideas are due mainly to the triennial examinations; without the latter, the former would have been powerless. These books are put into the hands of every child, and when he enters upon public life he wishes no other standard of morals, knows no other arguments for their enforcement, and learns from them how far the emperor and his officers can go. In this we may find one of the reasons, under God, for the perpetuity of the Chinese polity.

In practice, however, the evils are serious on both sides. The rulers are cruel and exacting, and the people turbulent and hard to control; but my experience leads me to the conclusion that most of the evils suffered in China from bad government come through the people themselves more than through their officers. A man will often lodge an accusation against his enemy in the full assurance that the charge will be taken up by the underlings and lictors, and the public courts thus be made a machine for revenging private wrongs. China should not be judged in these things above her own standards, but the average security of life and property is shown in the universal maintenance of law as the only safe defense for all classes, and the diffusion of wealth among those who have come legally by it.

In regard to the great population, which may be taken as one evidence of a mild government, it may be observed that the census which estimates 362,000,000 of people to be under the imperial sway, is not an excessive number when compared with some other countries. Their censuses, too, are taken for the purposes of revenue, and not for the information of other nations; and are not, therefore, designedly exaggerated, though they may be erroneous.

When we reflect on the wide prevalence of agricultural pursuits, the absence of all great estates and parks, and of pasturage lands devoted to raising cattle, the general harvest of two crops annually, and the great consumption of poultry, fish, and pork, the number of

inhabitants need not surprise us. In Europe, it has been estimated that only thirty-six per cent of the surface is actually in pasture or cultivated, and that forty per cent is still forest land. Still, although the weight of evidence favors the acceptance of the present census, we should be glad of some collateral evidence derived from careful examination of certain areas.

The Taiping rebellion, which devastated the central provinces for nearly twenty years, has been subdued; and those who are best able to judge reckon the loss of life, directly and indirectly, at nearly or quite 20,000,000 of people. As soon as the rebels were destroyed in a region they had overran, the government resumed its sway, and the people returned to their pursuits; and during this long struggle, I do not know of a single government officer who voluntarily joined the standard of rebellion. It had, at first, the character of being a Christian movement, and much sympathy was felt abroad for these converts thus trying to throw off the hoary superstitions of ages; but fuller examination led to the conclusion that there was no real religion in its leaders, and that the assumption of their chief, Hung Siu-tsuen, of being the younger brother of Jesus, was typical of their whole attainments in Christian doctrine. No proper fruits of the Gospel of peace, or patient continuance in well-doing, ever grew on any tree of their planting; and not until the insurgents were destroyed altogether, did the land find rest. At present, no organized resistance to imperial authority exists throughout the eighteen provinces.

The religion of a country has a mighty influence upon the character of its people, and that of China has molded her destinies. The worship of ancestors is really much more the religion of the great body of the Chinese than Buddhism, and has prevailed from very early times. Confucius encouraged it and upheld its observances as he found them, basing the prominence he gave to the parental authority upon its sanctions. Ancestral worship was known, indeed, among the Romans and other pagan nations, but the Chinese alone have elevated their departed ancestors to be their guardian and family patrons to the exclusion of all other tutelary saints. Such a worship, confined as it is to the household, requires no temples, no liturgy, no images, and what is far more important, no priesthood outside of the domestic circle. If a rich man builds an elegant ancestral hall for the reception of the family tablets, he, of course, never thinks of inviting other families to join in the worship, nor has he any need of paying a priest to conduct the liturgy. As the emperor and his kin

conduct the state religion without any priestly help, so does the paterfamilias perform his devotions with his wives and children before the ancestral tablets, where they believe that the spirits of those whose memories are dear, still dwell and seek the care of their descendants. By this means and the elevating morality of Confucius, China has, I think, escaped that evil of a hierarchy upheld by the state for its own security, as against the freedom of thought and belief of its own subjects, which has wrought so much misery in other lands, ancient and modern. Ancestral worship continually neutralizes the popular Buddhistic ritual, whose priests are used only as the purveyors of the departed souls to their last abode, and have no business with any subsequent worship. Being celibates they have shut themselves out of the amenities of the family, and are welcome to the protection of the gods they serve; but they never have been able to become, even though aided at times by imperial patronage, a power in the state.

One outflow of this worship has been the education of the people in industrial habits, for one of the first duties of a son is to maintain his parents; and when this duty becomes general we can easily see that the laws which protect property are certain to be respected so that the rewards of labor are secured. The Chinese divide society into the four classes of literary, agricultural, mechanical, and trading occupations, and pay them respect in this order. Another result of this regard has been to elevate the pursuits of letters and peace above those of war, and to this day all civilians take rank of military men of the same grade.

Labor, therefore, is highly respected, and study ennobles those who pursue it. One of the members of the Foreign Office, now dead, was the governor in 1849 of the province of Fuhkien, and published a geographical and historical account of other lands, the matter for which he had collected mostly from personal inquiries of Rev. David Abeel, an American missionary at Amoy, and of a son of Dr. Robert Morrison, at Fuhchau. Being too favorable in his remarks on foreign lands, he was degraded for its publication, and returned to his native village Wu-tai, in Shansi, about 1851, where he engaged in school teaching. Fourteen years after, this man Seu Ki-yu, was recalled to the service of his sovereign for the same reason which had wrought his degradation, viz., his superior knowledge of foreigners, then more than ever needed in dealing with them at the capital. Our own government, at my suggestion, sent him a fine portrait of Wash-

ington, whom he had eulogized in his *Ying Wan Chi Lioh*, or "Survey of what is Within the Islands and Seas;" and the last act of Mr. Burlingame as American minister to China was to present it to him in Peking. His infirmities erelong compelled him to resign and return home, where he lingered a few years.

The progress of the Chinese people was early marred by constant conflict between the central government, under an acknowledged emperor, and the kings of a dozen or more states, who continually weakened his power by their mutual rivalries and wars. This feudal government and these states, were thoroughly destroyed by Tsin Chi Hwangti, and has never revived, the monarchy continuing ever since as one centralized power, which has gradually extended its sway, and carried its institutions, language and literature over the whole empire. It has also permanently influenced all its neighbors, as the Coreans, Japanese, Lewchewans, Annamese and Tibetans. It was this monarch who built the great Wall about B. C. 220, which still stretches along near the edge of the Plateau for a distance of about 1,250 miles, one of the most remarkable trophies of human labor, as it is one of the most useless. The probability is that this stupendous enterprise was the result of a popular feeling that it would be, on the whole, an effectual (or at least a desirable) protection against inroads, and that its erection was not so much a forced labor as is often supposed.

The central government is not strong as compared with western nations, but it is strong when it acts with the popular will, and its subjects' welfare is considered. The provincial authorities are intrusted with great power and responsibility, and are held amenable for the proper conduct of affairs. Each provincial government is modeled on the same plan as that in Peking, and all officials are liable to be dismissed for maladministration at any moment. The governor-general at Canton, for instance, has the control of two provinces, whose area is about four times that of Pennsylvania, and their population twenty-six millions, or nearly that of the United Kingdom; and he is made responsible for the collection of revenue and maintenance of peace throughout their borders. The system has worked so beneficially for 230 years, during the present dynasty, that not one of these powerful satraps has raised a revolt; and during the previous Ming dynasty none are recorded as having been successful. How different from the Persian and Turkish empires during the same periods!

In estimating the causes of the perpetuity and uniformity of this people, their regard for the marriage relation, and the respect paid to woman in her various positions, should be mentioned. It is difficult for a man to get a divorce, and the rights of the wife and concubine are well-defined and upheld by law and custom. When compared with the Hindoos, Japanese, and Turks, the Chinese must, on the whole, be regarded as having reached a better and higher plane in these respects, and I ascribe it very much to the consideration paid to the mother by her sons. As this people have honored their parents, so they have been blessed by God with many days in the land which He has given them.

The present position of this mighty mass of our fellow-men has now been briefly surveyed. We see here the only nation which has come down to us from ancient days, exhibiting much the same features that it had in the days of Rameses, Sargon, Alexander, or Augustus, whose empires have risen and departed, while she flourishes more numerous, and as powerful as ever. We have tried to analyze some of the causes of this perpetuity, and explain the growth of those institutions, which, under God's blessing, have resulted in the maintenance of her own autonomy.

One of the obstacles to her advancement now, is the language. This language, which has heretofore done so much to elevate her character, acts, in the tedious labor necessary to acquire it, as a great impediment to the education of the people. They cannot, generally, afford the time to become proficients in it, and the course of study does not enlarge their minds, or teach them much that is useful in common life. The nature of the written language is like that of our ten figures, and its acquisition is so great a strain upon the memory at the time of life when the mind needs truth and science to strengthen its powers, that they become contracted and weak. The number of characters in common use is about 6,000; they are hard to learn, and are easily forgotten if one is out of practice; and, altogether, form a heavy burden upon the memory at the expense of the judgment. Each character is a word, possessing, in itself, no sound; and never undergoing any alteration in its form or name, for its various uses as a verb, noun, or adjective. The ignorance of the Chinese of other nations is partly owing to the fact that, without the aid of a living teacher, they are unable to learn other tongues; nor can they possibly write a book in their own language which will suffice, of itself, to teach a foreign language, as we can write a book in English by which one can learn to read and speak Chinese. This is owing to the imp-

sibility of representing the sounds of other tongues with accuracy, or explaining how letters combine to make words. It is to be hoped that, by degrees, the necessity of some change in the facilities of writing and speaking will suggest some remedy.

Since my arrival in Canton in 1833, great progress has been made in opening up the Chinese people and land to other influences, and bringing them within reach of their fellow-men. More advance has been made within the last forty years, I think, than within the previous four hundred; and this progress must continue to develop and enlarge. It will not prove, by any means, an unmixed blessing to them; but as I regard Christianity as the end and evidence of the highest civilization, this intercourse will set before them this high standard. Until very recently they never had its tenets presented to them in the sacred Scriptures; nor have they had, to any great extent, any examples of the purifying, elevating, and converting power of those tenets as seen in communities of native Christians. I regard this people as exhibiting, on the whole, in their peculiar civilization, as high a state of security and prosperity as man can attain without the Gospel. Taking its features of industry, respect to parents, love of law and order, and freedom from caste and an oppressive hierarchy of any kind; neither weighed down by a standing army, which forces the people to yield the products of their industry to rulers they dislike, nor so weak and inert as to be satisfied with a mere subsistence and have nothing to defend;—they offer to us a subject for intelligent examination worthy of more regard than it has yet received. Probably no nation, destitute of Revelation, has reached so high a position as this in all respects, especially in the scale of social and domestic virtues. But when you come to live among them, and daily meet with their lying, chicanery, and craft, see their pollutions and immoralities, and hear of their cruelty, injustice, selfishness and disregard of life, you can better understand how far beneath the lowest Christian community this vast mass of mankind habitually exists, and how unable they are of themselves to rise to the higher standard of the Christian faith. It is much that they have had so remarkable a man as Confucius for a teacher, in whose writings there is so little that is objectionable, and which have been taught them so effectually. They are now waiting for a higher moral standard, and it has also begun to spread among them. Nearly all their knowledge of it, and all other branches of human science, such as they yet have, has, I think, been given them by Christian missionaries. Few, besides these men, have learned their language for the purpose of

imparting to them these things; and the progress thus far has been rapid and encouraging, considering all the obstacles on their part, and the small number of workers, and will henceforth advance faster, because the agencies of good are greater and more efficient, and the distrust, ignorance, and opposition of both people and rulers are lessening.

At present the least hopeful outlook for their future prosperity is in the increasing use of opium, which is now imported and grown to a greater extent than ever, and reaches the enormous amount of over 30,000,000 pounds *av.* annually. Nearly half of this quantity is raised under the patronage of the British Government in India, which derives a large portion of its revenue from the export duty, and maintains the quality of the drug by careful skill in preparation, so that the Chinese prefer it to their own. The extensive use of this noxious narcotic carries poverty, distress, and disease in its train, and one can see no prospect of any immediate remedy in a financial or moral direction. The natives acknowledge the evils induced by its use, but have not the moral power to resist it; nor can the Chinese government prevent it coming into the country.

Many persons inquire respecting the comparative excellencies of the Chinese and Japanese, and ask which is the superior nation. It is not easy to decide, for their characters are diverse, and their culture has been very different and entirely distinct. The two nations may be compared in their prominent features to the English and French. The Chinese are the most industrious, methodical, and cautious, slow to change, and suspicious of novelties; while the Japanese are mercurial, inquisitive, fond of new things, and ready to adopt them before they well know what to do with them. This has been illustrated in their desire to purchase steamers, on which large sums of money have been wasted, when as yet there was no trade to employ them. On the other hand, the Chinese prefer to send freight in the steamers in their ports, and have only recently made or purchased them to run along their coasts. A few years ago a Japanese left Yokohama in a steamer he had purchased, and had proceeded down the Bay of Yedo a few miles, when he ascertained that no one on board knew how to stop the engine; in order to save the vessel from disaster the engineer went round and round in the open water till the fires went out, and then anchored. A Chinese would probably have never ventured to run a steamer until long practice under a foreigner had made him familiar with all her movements, but certainly would never have bought one till he could see his way clear to use her profitably.

In conclusion, the present position of the Chinese people and government is hopeful. The seclusion under which they have long remained has been removed, and foreigners can travel throughout the provinces with a good degree of safety, especially if they speak the language, and conduct themselves properly. The Government does not desire war with any nation, and will do much to avoid a quarrel, but its difficulties should be considered, and the weakness of its internal administration not be made a reason for forcing it to extremities.

The need of a better knowledge of other lands has been gradually forcing itself upon the highest officers of state, and the establishment of a college at Peking where their young men can learn foreign languages and science directly under their own eye, is a great step in advance. This college, called the Tung Wăn Kwan, is under the presidency of Dr. Wm. A. P. Martin, formerly a member of the American mission at Ningpo, and eminently well fitted for his duties. By his three principal writings in Chinese, viz., a discussion on Natural Theology, a translation of Wheaton's International Law, and a treatise on Natural Philosophy, he has become more widely known among the literary classes in the land than any other foreigner now living; while by his tutelage upon the minds of his pupils he will exert even a greater influence, perhaps, upon the progress of the state.

The arrival of 120 Chinese youths in this country, sent by the Government for the purpose of going through a thorough course of education in theoretical and practical science, according to their various capacities, is another evidence of the same desire to learn whatever will prove advantageous to their country. Perseverance will gradually fit the lads to carry on whatever they undertake, and the rulers prefer to wait until they can themselves introduce many of the improvements which foreigners are so urgent to do for them.

In so brief a survey of the Chinese character, it is impossible but that many points have been omitted or imperfectly noticed. I feel, however, that I am speaking to an audience in a Christian land, whose sympathies are with the advance of that people in the highest Christian culture. It is the gospel of redeeming love which can alone elevate and teach them true civilization, and this they have never before been taught. To give them our material prosperity and power without our moral restraints and sanctions, will be like starting a locomotive engine without an engineer, and can only result adversely. Let us, therefore, rejoice in the opportunity now offered us of aiding them to rise upon the same basis of truth, freedom, and just laws, which our position and advantages give us.

UGUNDA AND THE WHITE NILE.

By Col. C. Chaillé Long, Bey.

[Col. Long's paper opened with a brief review of the history of Egypt down to the reign of the present khedive, descriptions of the remains of her ancient civilization, of the career of Alexander of Cairo, of social life and manners, and notices of the expeditions of Speke, Baker and Stanley. When Sir Samuel Baker's term of service in Egypt had expired he was succeeded by Col. C. G. Gordon, C. B., of the British royal engineers, a distinguished officer who had won the sonbriquet of "Chinese Gordon," in connection with the phrase "ever victorious army" in China, where he commanded so successfully in the imperial interest during the memorable "Taeping rebellion" that he has since been deified by the Chinese. By request of Col. Gordon, Col. Long was named his chief of staff, and twenty-four hours after, on the 21st of February, 1874, in advance of all impedimenta, he started for the Soudan via Suez and Sonakin, the objective point being Gondokoro the prospective seat of government. Omitting these preliminaries, the remainder of the paper follows:]

I may not detain you for want of time along the route, but shall take you in forced marches of twenty days to Khartoum, and from thence twenty-six days by steamer to Gondokoro, a distance of 1,500 miles, stopping only to present you a *coup d'oeil* of misery in nature and in inhabitants which, after leaving Khartoum, seems to consecrate Central Africa and its inhabitants to eternal barbarism.

These 1,500 miles of the White Nile are made through vegetation that threatens at times to bar the way. On each side lay fetid marshes rank with poisonous odor, while upon its dangerous and treacherous surface wander great troops of elephants and wild buffalos. The river is full of crocodiles and hippopotami, the roars of the latter only breaking the terrific silence that reigns in these regions.

The banks are inhabited by the Dinkas and Chillruks and present the same dismal aspect as the banks of the Sanbat, afterward navigated. Encircled by a cordon of fire that preserves him alike from the venomous bites of the mosquito and the attack of lion, leopard and hippopotamus, indolent and timorous, the Chillouk finds

with difficulty sufficient means of subsistence in the doubtful pursuit of the wild beasts that surround him, when he is deprived of the resource of fishing with his spear, his only mode of catching fish. One year would suffice to annihilate these beings among whom famine has become a chronic state.

With the Chillouks as with the Dinkas the cow supplies the place of every other divinity. These cows, as emaciated as themselves, give but little milk and they never kill them for food, not alone by reason of their superstitious veneration but from the fact that their possession is a guarantee of freedom, for the sheik of every negro tribe detains as slaves such as do not possess at least one cow. These people live in idleness, sheltered from the burning rays of the sun by a dense curtain of smoke. Besmeared with muck mixed with ashes they seem yet more hideous with their protuberant jaws, their lower incisors extracted, and their upper teeth projecting from their upper jaw like the tusks of a wild boar.

These miserable wretches have been endowed by unscrupulous travelers with attributes that the most deplorable conditions, both of climate and habitation, render impossible. The Chillouk has been presented as the founder of a great kingdom in Sennaad, but his wretched state and miserable appearance alone suffice to belie the statement of his ever having played so grand a historical part.

Over the apparently boundless marsh through which the Nile finds its serpentine way, there is nothing that breaks the terrible monotony save here and there the smoke-covered villages and high ant-hills, whose cone-like shape often deceives one into the belief that they are huts. Ten to twelve feet high, they serve as lookouts for the nude negro who, leaning upon his spear, his leg uplifted and forming an angle with his right foot resting upon the knee of the left leg, regards with excited gaze and gesture the passing steamers.

On the seventeenth we had passed through this dreary waste of pestiferous marsh, this gloomy River Styx, and on each side now rose the undulating plains of the Bari country. We had arrived at Gondokoro 1,500 miles south of Khartoum and 3,500 miles from Cairo!

Gondokoro, consisting of a collection of straw huts and a magazine of stores, was held by a garrison of 500 troops, infantry and artillery. These were in a wretched state of health for Gondokoro had proved a cemetery not only to the Arab element but to the Europeans of Sir Samuel Baker's expedition, as it did subsequently to our own.

The Austrian Catholic mission had sent a band of devoted men

here who had erected a brick "cannisa," or church. A few rods away covered with the *débris* lay the rude graves over which memory had raised no trophy save the dust of the broken bricks, for the Baris had pulled it down and with the dust mixed with grease had besmeared their bodies with the red color they affect.

Loron, the great sheik of the Baris, came to see us; a tall, magnificently built man, attired *in puris naturalibus*, a national distinction of the Baris, as in fact of all these tribes south from Khartoum to Ugunda. Upon their shoulders they carry a little stool quaintly fashioned. Their bodies, as already noted, are besmeared with grease and oxide of iron. The ladies wear a girdle consisting of strips of leather finely fringed, whilst from behind the "correct thing" is to have a long bushy tail falling nearly to the ankles. This is to be fashionably dressed *à la Bari*, with hair carefully plucked from their heads. Their india-rubber-like appearance reminds one of Goodyear's patent.

On the 20th of April Col. Gordon returned to Khartoum. The prospect of aiding in the work of regeneration of Africa, —

> "To scatter plenty o'er a smiling land
> And read their history in a nation's eyes, —"

had received through the long stretch of dreary deadly marsh that interposed from Khartoum, a very sensible shock, added to which was the disheartened tone of officers and men, whose sickly emaciated appearance too truly corroborated their long-drawn griefs. To me there was a sentiment of duty rather than enthusiasm that rose high above the apparent obstacles to my purpose.

The expedition to the Lake Victoria Nyanza had been suggested to me by the impatient desire of the world to know something of that mysterious region, the source of the Nile. With an appreciation of the wishes of the khedive to extend at that time the limit of Egypt, I had in my mind's eye the connecting of the two Lakes Victoria and Albert, till now a problem left unfinished by Capt. Speke. The presence of a wily black named Bakeke at Gondokoro, who had come from M'Tsé, bearing a letter addressed to Sir Samuel Baker, supposed to be from Lieut. Cameron, seemed to me a propitious circumstance. Nervous as to his return, he gladly welcomed the announcement of my intended visit to Ugunda. There were then at Gondokoro a detail of the Loudanieh corps, who, with 300 Fatiko porters, had brought ivory to the post and returning would escort me to the last military post on the frontier of Ungoro, where I should be

man and horse as we made our way quickly to the neat *zeriba* grass-hut village, inclosed with a high grass wall especially construc for me. Ugunda was all agog; the roads were blocked with thousa that pressed around the gate of the inclosure where the flags of Eg and Ugunda had been planted, attempting to get a sight of strange guest of their king. To each one of my suite was assig a hut; my own was constructed with care, and evidently designec M'Tsé to surprise me, since, divided into apartments, it show marked difference to the miserable hovels we had so far encounte

On the following morning, the twenty-first of June, a messer arrived and begged me to visit M'Tsé. At 8 o'clock, though the was excessive, and the rays of the sun insupportable, I prepare obey the summons, and donned my uniform, then similar to worn by the officers of the Chasseurs d'Afrique in France. The lace and ornaments upon tunic and red pantaloons, had, fortuna escaped injury from rain and damp, packed in the iron cases in this country, are the sole protection both against the elements against the destructive ant.

At the door stood my horse, Ugunda, attended by Selim, Said abd-el Rabman, who were dressed in red shirts and white pantal Mounting my horse, I was greeted by shouts of enthusiasm that re-echoed by the distant hills, now covered with human beings. ceded by the *kongowes*, or general-in-chief, I proceeded to the p situated on the hill in the center of an amphitheater formed by high walls or palisades, through which entrance is had by op gates, to which cow-bells are attached. Through each gate an ble hand rang wildly those bells, and the detached gates sli view, giving entrance. Passing the seventh gate I found my front of a large pyramid-shaped hut of grass supported by ridor of columns.

From within a man of majestic mien approached the wi portal; this was M'Tsé. He appeared thirty-five years of tainly more than six feet high, a face of bright copper-color, but exp rom his large, restless eye, a gleam of fi tality s marred an otherwise sympathetic ex He was cloak, common, in fashion, to that the better ts. The texture was of bl trimmed ceful folds, w a white belt in go wrough mitar

were inclosed in sandals of Moorish pattern — all procured, evidently, from Zanzibar. He advanced to meet me with graceful salutation as I dismounted from Ugunda, to whom his eyes alternately wandered with an expression of fear as if he regarded me as fresh from the Inferno. The din and noise from horn and drum now became deafening. Retrograding to his royal throne, he gave me a seat near him, an honor never before accorded to any one by this potentate, and the council was opened. His ministers, one by one, prostrated themselves before him, raising in quick succession their clasped hands in repeating the Ugunda salutation *Yanzig! yanzig! yanzig!* By a discourse, in which I touched his vanity to the highest degree, I spoke of the object of my mission, and expressed a desire to visit the Lake Victoria, that had been denied to Capt. Speke, and to discover that part of the Nile which till then had remained unknown. I spoke in Arabic as follows: "Oh, M'Tsé, great king of Africa, I have come in the name of the Sultan at Cairo to present you his gracious salutation. The world has heard of a great African king, and my sovereign, in sending me to him, wishes me to express his friendship and interest in one for whom he wishes continued health and greatness."

This was received with shouts of *Yanzig! yanzig!* as they screamed and danced in a mimicry of hostile attack against M'Tsé.

The king suddenly rose from his seat. A slight but significant contraction of the eye caused the disappearance of the *marsalah*, who, quick to do their master's will, snatched from their turbans the plaited cord, and seizing their unresisting victims to the number of thirty, amid howls and fearful yells crowned in blood the signal honor of the white man's visit to M'Tsé. It required no common effort to repress my feelings at this moment, or to assume the careless air that concealed what was going on within, for all eyes were watching me intently, and a sign of feeling, even though I attempted no remonstrance, would have subjected me to ridicule and a loss of prestige, if not to death.

Singular contradictory combination in the savage negro: that cowardly himself, he most admires coolness in others. To protest would have been as useless on my part as impolitic. This was a custom common to all great negro potentates, a prerogative that went with the claim to African greatness, whether at Dahomey or at Ashantee.

[illegible]row myself in the "bloody chasm" in opposition to this modern
[illegible]e with my two soldiers, as regretted by my critic in Lon-

alone with my two soldiers, Said Bajarrah and Abd-el Rahman, who had volunteered to accompany me, destined to be my faithful and devoted companions and comrades in arms in all the eventful scenes of misery and hardship that marked our joint adventures. My two unfaithful and useless servants and a miserable exiled wretch, in the capacity of interpreter, composed my staff, together with my horse, "Ugunda," and my *sais* or groom, Suleiman. My horse served me well in the 600 miles of bog and jungle that marked the way to the lake, kept me company in the long vigils of stormy nights, and secured for me, doubtless, on my entry as a "centaur" at the palace of M'Tsé, the honors of human sacrifice, accorded only to the equals of African kings. I shall not ask you to accompany me through all the *peripéties* of painful details of incident and suffering that marked the journey of fifty-eight days to Ugunda, marked by incessant and torrential rains and living upon the food of the country, simply ground *dourah* or corn, until I found bananas at Ugunda. My tent, already worn and in tatters, afforded me but little protection from the elements, and jungle fever had attacked us all before reaching the last military post and had become part of our daily *menu*.

On the 20th of June, from the heights of a hill that looked upon a corresponding one, the palace of M'Tsé was espied; he had already caused me to be welcomed four days before by his army of 4,000 warriors camped upon the frontier of his country. Its interminable banana groves, broad, well-swept roads, for he had caused them to be swept for his illustrious and princely guest, seemed a paradise to us in comparison to the bog and morass of the low marshy land of Ungoro through which we had passed. These troops carried at the head of column the flag of Ugunda, accompanied by music from horns made of elephant-tusk and from numerous drums whose hoarse sound was accompanied by the vocal imitation of the crow. Armed with lances, there were a few in fantastic uniforms with fezes of red flannel ornamented with black feathers, who skirmished in remarkable evolutions on each side of the column, and formed, with a front fifty deep, the special guard of the king. They carried guns of Moorish and most ancient pattern, and their reckless firing was anything but assuring, as the uncertain matchlock was pointed not unfrequently in close proximity to my head. A troop of men dressed wholly in plantain leaves curiously arranged around the body, kept time with grimace, wild gesticulation and dance to the music. A throng of curious girls peered out with startled gaze from

the thick banana forests or fled with gazelle-like fleetness at the sight of man and horse. It was a proud day for Said abd-el Rabman and Selim as they marched in front of me, dressed in their gay uniforms kept for the occasion. Ugunda, too, seemed proud of the distinction of being the first horse that had been to Central Africa, and that through every season had defied the reputed deadly tetse fly. His diet of bananas, that had now become our only food, had in no way depreciated his appearance, though its effect upon my health was very perceptible. I forgot for the moment the physical pain to which I was a victim in the strange *coup d'œil* that presented itself to my view. A succession of hills covered with waving banana groves rolled away and lost themselves in the mists that seemed to bind in its mysterious folds the source of the Nile. On every hillside thousands of the Ugundas were gathered, while directly in front of me, at the outer gate of the palace, stood the great M'Tsé himself, surrounded by an immense throng and his numerous harem. For a long distance a mass of men struggled to catch sight of the *M'bugurn* the "white prince," as I was already termed. In my immediate vicinity they had prostrated themselves in token of my august presence. Still mounted, I received the messengers, who quickly approached, and, throwing themselves at my feet, conveyed to me through Selim, who spoke the Ugunda language, the expressions of welcome of their king. These men merit description here. Chosen for ferocious appearance, there is a wild glare of brutality in their gleaming eyes, whilst their long black beard proclaims their origin other than that of Ugunda, perhaps Malay. Their dress consists of pantaloons of red and black flannel, bordered with black; a tunic of red flannel with black stripes dolman-like across the breast, from which hangs a fringe of a peculiar monkey-skin; a red cloth turban, around which is woven, in tasteful coils, a finely plaited cord — badge and instrument alike of their deadly office, for they are the *bourreaux* at the court, the executioners of M'Tsé's undisputed will! The king requested that I should approach, that he might see the beast upon which I was mounted. Gathering the reins in my hand, I drove my spurs into the flanks of Ugunda, and sped with fearful pace down the hill toward M'Tsé and harem, who broke into flight and screams of dismay. Returning, and when in the act of dismounting, a rush and a general *sauve-qui-peut* took place. They had thought me, till now, a centaur!!

Reassured by Selim they crowded around in dumb amazement at

man and horse as we made our way quickly to the neat *zeriba*, or grass-hut village, inclosed with a high grass wall especially constructed for me. Ugunda was all agog; the roads were blocked with thousands that pressed around the gate of the inclosure where the flags of Egypt and Ugunda had been planted, attempting to get a sight of the strange guest of their king. To each one of my suite was assigned a hut; my own was constructed with care, and evidently designed by M'Tsé to surprise me, since, divided into apartments, it showed a marked difference to the miserable hovels we had so far encountered.

On the following morning, the twenty-first of June, a messenger arrived and begged me to visit M'Tsé. At 8 o'clock, though the heat was excessive, and the rays of the sun insupportable, I prepared to obey the summons, and donned my uniform, then similar to that worn by the officers of the Chasseurs d'Afrique in France. The gold lace and ornaments upon tunic and red pantaloons, had, fortunately, escaped injury from rain and damp, packed in the iron cases that, in this country, are the sole protection both against the elements and against the destructive ant.

At the door stood my horse, Ugunda, attended by Selim, Said and abd-el Rabman, who were dressed in red shirts and white pantaloons. Mounting my horse, I was greeted by shouts of enthusiasm that were re-echoed by the distant hills, now covered with human beings. Preceded by the *kongowee*, or general-in-chief, I proceeded to the palace, situated on the hill in the center of an amphitheater formed by seven high walls or palisades, through which entrance is had by opposing gates, to which cow-bells are attached. Through each gate an invisible hand rang wildly those bells, and the detached gates slid from view, giving entrance. Passing the seventh gate I found myself in front of a large pyramid-shaped hut of grass supported by a corridor of columns.

From within a man of majestic mien approached the wide-open portal; this was M'Tsé. He appeared thirty-five years of age, certainly more than six feet high, a face of bright copper-color, nervous, but expressive. From his large, restless eye, a gleam of fierce brutality shone out that marred an otherwise sympathetic expression. He was dressed in a long cloak, common, in fashion, to that worn by the better class of Arab merchants. The texture was of blue cloth, trimmed with gold. Around his head, in graceful folds, was wound a white turban; his waist was encircled by a belt in gold, richly wrought, from which was suspended a Turkish scimitar; his feet

were inclosed in sandals of Moorish pattern — all procured, evidently, from Zanzibar. He advanced to meet me with graceful salutation as I dismounted from Ugunda, to whom his eyes alternately wandered with an expression of fear as if he regarded me as fresh from the Inferno. The din and noise from horn and drum now became deafening. Retrograding to his royal throne, he gave me a seat near him, an honor never before accorded to any one by this potentate, and the council was opened. His ministers, one by one, prostrated themselves before him, raising in quick succession their clasped hands in repeating the Ugunda salutation *Yanzig! yanzig! yanzig!* By a discourse, in which I touched his vanity to the highest degree, I spoke of the object of my mission, and expressed a desire to visit the Lake Victoria, that had been denied to Capt. Speke, and to discover that part of the Nile which till then had remained unknown. I spoke in Arabic as follows: "Oh, M'Tsé, great king of Africa, I have come in the name of the Sultan at Cairo to present you his gracious salutation. The world has heard of a great African king, and my sovereign, in sending me to him, wishes me to express his friendship and interest in one for whom he wishes continued health and greatness."

This was received with shouts of *Yanzig! yanzig!* as they screamed and danced in a mimicry of hostile attack against M'Tsé.

The king suddenly rose from his seat. A slight but significant contraction of the eye caused the disappearance of the *marsalah*, who, quick to do their master's will, snatched from their turbans the plaited cord, and seizing their unresisting victims to the number of thirty, amid howls and fearful yells crowned in blood the signal honor of the white man's visit to M'Tsé. It required no common effort to repress my feelings at this moment, or to assume the careless air that concealed what was going on within, for all eyes were watching me intently, and a sign of feeling, even though I attempted no remonstrance, would have subjected me to ridicule and a loss of prestige, if not to death.

Singular contradictory combination in the savage negro: that cowardly himself, he most admires coolness in others. To protest would have been as useless on my part as impolitic. This was a custom common to all great negro potentates, a prerogative that went with the claim to African greatness, whether at Dahomey or at Ashantee. To throw myself in the "bloody chasm" in opposition to this modern Nero, alone with my two soldiers, as regretted by my critic in Lon-

don, would have been as vain as the imputation of want of feeling is untrue.

The interview had now ended, the horns and drum were silent, and sickened and oppressed I arose to go. M'Tsé followed me to the door, where I was met by the anxious faces of my soldiers. He took me into his harem, that he might show me his wives, numbering more than 100 women, very pretty, and all clothed in the tasteful garment common to both sexes in Ugunda, consisting of a cloth sewn together from fragments made from the bark of a tree. They surrounded me, examined my gay uniform, pulled my hair. As I lifted my fez from my heated and throbbing head, they laughed and giggled with delight and astonishment until M'Tsé said to me, "Come away, M'bugura; they will annoy you." I fancied I saw a shadow of jealousy reflected in his wicked eye, and I needed no second invitation to obey the summons. During the promenade through his numerous nicely constructed huts, he brought me a boy of about twelve years of age, an albino, with every characteristic of the negro race save perfectly white skin and wool. This very boy has been doubtless shown since to Mr. Stanley, and perhaps has served him as a basis upon which to predicate his existence of a white race in Africa. The following morning I presented my *salaam alak;* that is to say, the gifts which African etiquette requires that every visitor shall give. Among objects presented was a very large mirror and an electric battery; both had a success beyond my expectation. With the latter, that I had named my little "Lubare," I gave them some very rude shocks, that is to say I knocked them down. The effect was electric in more than one sense, and I may add that if I were an enthusiast in the idea of the quick regeneration of the savage African I would suggest the use of the magnetic battery. It clothes the possessor with every attribute human and divine, and the negro yields a ready submission thereto. This little "Lubare" was an open-sesame for me to the African heart, and with my horse Ugunda my good star had placed two charms in my hands that were to win me success where others strong in resources had failed.

I had forgotten here one other little friend, a music-box with which on the march when sleepless I had beguiled the long hours of the night. It played "Tramp, Tramp, Tramp the Boys are Marching," "Dixie," "Maryland, my Maryland," and "When Johnny Comes Marching Home," the latter in a fearfully inebriated state if one might judge from its stops and uncertain halts.

By patient questioning I endeavored during my stay of twenty-nine days as a guest of the king to trace some tradition that might serve as a basis for their obscure origin. Iconoclastic in the most literal sense, the customs of one king are lost in the egotism and vanity of his successor, and hence even tradition ceases. A very old Arab MS. was shown me by M'Tsé. Ide, his interpreter, could not decipher its text; it suggested to me the idea that perhaps it might have found its way into Central Africa at that epoch subsequent to the flow of Moslem invasion on its eastern coast — the trace of some Arab nomad, some kindred spirit of that noted Arab traveler, Iba Batutah, who had reached the heart of Africa in quest of ivory, gold and slaves, known doubtless to the ancient Egyptians who must have drawn from these regions myriads of those slaves that built their monuments. M. Napoleon Ney, of the French Geographical Society, has presented to the Geographical Congress a study of the commercial relations of the Arabs in Central Africa, in the thirteenth and fourteenth centuries, in which he claims that Arab manuscripts translated from Greek works were distributed in the Soudan in the interest of commerce at that period. With copper-colored complexion, and little of the characteristic formation of nose and mouth of the negro, the Ugunda, as well as the Niam tribes whom I afterward visited, would seem to owe this amelioration of the race to the cause here indicated, the Arab invasion.

The country here is really picturesque, but like all of Central Africa it is interspersed with pestiferous marshes from which the deadliest odors arise. The banana is the principal food, though the country produces Indian corn, sweet potatoes and sugar-cane, and a splendid breed of cattle exists. The art of tanning, as shown by the leopard skin here to-night, presented me by M'Tsé, is carried to a perfection that may bear favorable comparison with that of Europe.

Visit to the Lake Victoria.

By the 14th of July, I had so won upon the affections of the capricious M'Tsé that he furnished me with an escort to visit the Lake Victoria. Arriving at Murchison creek after a march of three hours, we were met by an escort of 1,200 men of the Ugunda marine in forty boats; in each there were thirty rowers without counting musicians with horns and drums.

These boats are made of a thick bark, nicely sown together, and ornamented at the prow with the head of a deer. It was in these

that I subsequently descended the Nile from Urondogani to Karuma falls. We started almost immediately for the lake, but a heavy storm coming up we encamped upon the banks of the creek.

On the morning of the fifteenth, the sound of the *nogarraoh*, drum and horn, announced the departure for the lake. The discordant din broke over the unruffled surface of the water, re-echoed again and again by the surrounding hills. For the first time I felt something akin to enthusiasm as I looked down from my seat on the overhanging bank. The grey mists of morning were being tinged with a golden light as the sun struggled to appear. The creek, with its dark fringe of trees and banana groves, lent a beauty to the scene that one sees seldom in Central Africa; but, to be frank, there was nothing grand, nothing to cause those effusions so commonly indulged in by travelers who draw fancy pictures.

An hour later every preparation had been made, and the squadron pushed off, splashing and dashing in continued spray, as each one sought to out-distance the other in fast and furious race.

The waters were clear, transparent, and ice-cold. With what pleasure I leaned over the side of the boat and bathed my aching head, and drank deeply of what seemed nectar to me, may only be imagined by one whose blood had seemed, for days, as a current of fire. Gaining, at night-fall, the western side, we encamped.

The depth of the lake is from thirty to forty feet. Its width seemed between eighteen and twenty miles. But I was deceived by what seemed to me to be a coast-line, which, as proved since by Mr. Stanley, was a group of islands. The lake has the width given it by Captain Speke, and its circumnavigation by Stanley has added nothing essential to what had already been written by Speke, to whom the honor of its discovery belongs. My escort refused, positively, to permit me to cross to the eastern shore and determine its width. With but two soldiers, and in a weak and almost dying condition, I was obliged to turn my back upon the lake and return to the palace of M'Tsé.

On the nineteenth I quitted Ugunda. The evening before my departure I sent again to the king to renew my thanks for his uniform kindness to me. He wished to load me with ivory, and sent me, in spite of my refusal, a quantity of beautiful cow, leopard, and other curious skins, most beautifully sewn together, making large sheets, ten large ivory tusks, as a special present for *Acherie*, "his brother," meaning myself; many articles of necklaces and bracelets,

made of ivory, and ten large bolts of native cloth. These were afterward sent me when he had heard that I had successfully accomplished the navigation of the river that he assured me was impossible. The march to the river at Wrondogani, from whence I proposed to navigate to Foweira, should have consumed three days — it took twelve. The porters furnished me by the king, in order to revenge themselves upon me for the friendship of M'Tsé had shown me, abandoned me and stole my baggage. I quote here from my itinerary the letter to show the misery to which I was subjected on the way:

"On the 29th a march of four hours was made, through the jungle grass at least twenty feet high. At 1 P. M. a storm, the most terrible I had ever witnessed, broke over our heads, accompanied by flashes of lightning that in their vividness nearly blinded every one, and left the scarcely perceptible path invisible in the succeeding gloom. We were compelled to bivouac in a banana grove, from which on the following morning the road ran through great, dark forests that at midday even obscured the rays of the sun, and where perpetual shades re-echoed alone the hoot of the owl and cries of monkeys and parrots.

"In this frightful gloom of forest, and in the close companionship of beasts that ever and anon, whether elephant, lion or leopard, crossed our path, I said to myself, 'Here, indeed, is the Africa of my boyish fancy; a hell on earth, whose rich vegetation and flowers, like the upas tree, breathe poison and death.' Scattered here and there over this dark and silent forest-road were human skulls, in fact, every portion of the human body, belonging to the wretches that had been sacrificed, to prevent my further progress, to deter me from leaving Ugunda, since ordered to escort me back they feared to cross the hostile Keba Rega's territory. Finally on August 7th, we arrived at the river, where, after much trouble, we embarked. It was arranged that Selim, with my horse, should accompany the escort by land. On the eighth day the appearance of a suspicious-looking boat on the river determined the timid Ugunda to desert with five pounds of flour, five pounds of beans and one sheep. I am thus left alone with Said abd-el-Rabman. On the morning of the ninth, having ordered Selim to proceed by land and await me at Mrooli with provisions that M'Tsé had promised me, we embarked. The river was wide and deep. Our two boats contained my two soldiers, two servants, and three children that at the last moment had been a most embarrassing

gift from M'Tsé, etiquette at court obliging me to accept. They proved of invaluable aid to us, however, in bailing our constantly leaking boats."

DISCOVERY OF LAKE IBRAHIM.

On the eleventh we passed a high mountain called by the natives Gebel-M'Tinji, and shortly after, as if by magic, we entered a sheet of water in which the river lost itself in the mass of nymphæ or lotus and the *Pistia strabobis*, a cup-shaped lily which grows here in great abundance. The nymphæ, or lotus, comes up from twenty to thirty feet depth, while a thick and almost impenetrable jungle of papyrus, or bullrush, effectually prevents the shore being reached. With scanty provisions, while storm after storm beat upon our suffering and devoted band, we finally found hid in a cavern-like passage of this papyrus-jungle a straw hut, upon a floating island inhabited by savages as black as Hades, who live alone upon decayed fish, the stench from which was almost intolerable even to our little fastidious taste. For three days we had not quitted our boats, and consequently our scanty ration of flour mixed with water had been our only food. Here on this isle of an inland sea, we soon built a fire, killed our sheep, and, half famished, ate with avidity our smoked rather than cooked mutton. The savages had now commenced to assemble, and fearing an attack, we hastily beat a retreat, regaining the lake only to pass the night at the mercy of fearful storms that seem here to revel in furious wind and rain, deprived of my compass, that had been accidentally broken into fragments. For two days we were enveloped in impenetrable mist and rain, beaten about in the lake only to find the current of the river on the fifteenth.

This was Lake Ibrahim, a great basin. I felt convinced that it constituted one of the sources of the Nile, in common with Lakes Victoria and Albert. Elated by this discovery, it lent renewed vigor in the struggle to keep up my courage and that of my two soldiers, who, overcome with fatigue, were now giving signs of despair, influenced by the cowardly conduct of my two servants, who had long since become useless. Lake Ibrahim is the great vegetable nursery for the White Nile. The almost tranquil lake is relieved of its heavy pressure of water, fed by almost perpetual rains, when this vegetable field decays annually, and, loosened, floats upon its bosom in detached islands of the papyrus and *Pistia strabobis* that rush down and pass Karuma falls into Lake Albert and north. This it is causes that

annual rise in the Nile, certainly as far down as the Bahr-el-Ghazall.

On the sixteenth I had arrived within a short distance of Mrooli, where, on the morrow, I hoped to find Selim with the much-coveted provisions.

Battle of Mrooli.

Forcing our way with knife through the papyrus, like canebrake, we encamped on the right bank of the Nile, exposed during the whole night to a merciless storm, since my tent no longer afforded shelter. The morning of August seventeenth dawned and a grateful sun, though fiercely hot, awoke us from a fatigued slumber. Hastily swallowing the relics of our paste of the night before, we embarked our cases in our two boats, the openings of which we had stopped with weeds and rags. At ten o'clock we left the shore, and about midday attempted to gain the opposite bank, from which Mrooli was plainly to be seen. Shots were fired in air, in order to announce our arrival, as agreed upon. There was no reply. Evidently, Selim had not arrived. At the same moment, to my horror and surprise, I espied, hid in the thick mass of papyrus that lines the shore, the sinister faces of armed men, whose well filled boats were bristling with lances, who now, with wild yells and the beating of the nogarrah, or war drum, deployed into the stream. It meant war.

A hurried word of caution to my men caused the boats to be allowed to drift with the current, and to be tied quickly together to give steadiness and security. The iron cases, ten in number, were quickly placed as a barricade, and our fortunately good stock of cartridges arranged in convenient place for action. Two Snyders of my men, and my Reilly elephant rifle with explosive shells, with three revolvers, though splendid arms, seemed yet but idle weapons against a force of at least 500 savages who now advanced to the attack, confident in the attempt to surround me. They were the men of Keba Rega, King of Unyoro, the same who in June of 1872 attacked and defeated Sir Samuel Baker at Masindi. The *mtongoli*, or chief, who spoke a little broken Arabic, announced to me "that he had been sent by Keba Rega to kill me; that they had awaited my coming for days, adding, "It is useless for you to resist; the fishes will eat you at sundown." With shouts of defiance they renewed their war song, amid a horrid din of drums and horns, their hideous faces illumined with savage, devilish glee at the prospect of blood and murder.

Abd-el-Rahman, no longer able to restrain his excitement, lifted up his rifle to shoot. When, throwing off the horror of our position

that seemed about to paralyze further effort, I cried, "If you shoot I will kill you!" His arm fell immediately in obedience. Raising my elephant gun several times, only to receive the most insulting jeers of the defiant sheik, I planted, finally, in his breast an explosive ball that, bursting there, seemed to let out his life-blood all at once, as, dripping in gore, he fell over on his comrades, and in doing so capsized them all in the stream. Resting our guns upon the barricade of cases, our firing was quick and accurate. Crowding together as capsized in one struggling mass in the deep river that here was almost 1,000 yards wide, but few of their spears could reach us, whilst they became an easy target to our shots that tore into their boats, or, bursting in their naked bodies, carried consternation and terror where, only a moment before, a hellish desire for massacre animated them in their fiendish glee. Unperceived by me, and protected by a detached island of papyrus that floated by, a savage had endeavored to close with us; my servant Adam, saw his deadly lance raised close to my head, as, enveloped in smoke, I was directing my fire elsewhere. He seized one of the revolvers placed for close action, and, firing, I received the shot in my face and fell, senseless and bleeding, behind the case that had served me as a rest and barrier. Although an ugly wound, I soon regained consciousness, and in the course of two hours the greater part of the savages had reached the shore, following us until sundown. We learned, afterward, through Keba Rega himself, who sent straws to denote the number of his loss, that eighty-two had been either drowned or killed, including two of his greatest sheiks. Resuming the paddles we kept them incessantly in hand all night in order to distance the savages, from whom we might expect an attack in the morning, as they never attack after sundown.

Four days after, in a famished and pitiable condition, we arrived at the military station at Foweira, where we were received with great joy by the garrison and Rvonga, a friendly king. The sound of a bugle-call at midnight, in response to our firing, had assured us of our safety, at the sound of which my comrades, soldiers and servants, weak and emaciated, cried for joy.

Received by a brave officer, the commander of the post, who had been in the Egyptian legion in Mexico under Bazaine, we soon improved in health. My wound, however, was obdurate, and gave me great pain, whilst my servant's feet were swollen to enormous size. Without medicine, cold water and an oil compressed from a seed called *sim-sim* was our only resource. Subject to severe attacks of

jungle fever, it became our daily menu, and we took it as a matter of course.

Selim, charged with my horse, did not arrive until September 13th. It appeared that he had gone into camp with my fugitive escort, and there had made good cheer of the forty head of cattle sent me in good faith by M'Tsé.

On the thirteenth of September, whilst seated under a tree near my hut that overlooked the river as it went past to Lake Albert, ten soldiers came toward me dragging, with difficulty, something that seemed like a tree. What was my astonishment when it proved to be a huge *Boa constrictor*. Major Zaba Tuka had frequently told me that a huge monster had come nightly to suck the cows penned near my hut, but, incredulous, I had registered it as a wonderful snake story. Only the preceding night, however, my men, seated around the fire in the hut adjoining mine, had precipitately fled in terror at the appearance of a huge head that had looked at them from an interstice in the grass wall, whilst at their feet countless small serpents glided about. The cause was now apparent — the eggs of the boa had been laid near the outer wall, and hatching, the young had invaded the hut just as the female came from the river; returning therefrom she had been shot by the soldiers. I confess that, at night, in my fever-racked brain, I felt more than once, in my heated imagination, the icy folds of the boa as it held me in Laocoön-like embrace.

Nearly 400 miles still intervened between this station and Gondokoro, and, at this terrible season, it would be necessary, at times, to cut the way through the jungle and cane-like grass with knife and bayonet.

On the fifteenth of September, Selim having arrived with my horse, we started on the terrible journey. Still ill, weak and emaciated, yet strong in the struggle for life and return, it would be only to trespass upon your patience and time to recount here the varied scenes of misery, suffering, and evil incidents that marked the long weary route. On the eighteenth of October, thirty-three days after, we arrived at Gondokoro, long since given over for lost. My reception was warm and generous in the extreme from Gordon Pasha, the governor-general. During my absence, his aids Lenant, Anson, De Witt and Major Campbell, had died of fever, and the health of the troops was deplorable, proof positive that Africa, by some decree of nature, is marked as the exclusive home of the negro, since the Arab succumbs as well to its pernicious climate.

On the twentieth of October, by advice of the governor-general, in the interest of my precarious health, I took the steamer for Khartoum, there to communicate to the Egyptian government the result of my expedition south, which has had its result not alone in the extension of the limit of Egypt, but has opened a wide field of commercial interest to that country in the boundless quantity of ivory to be found there.

Whilst at Khartoum I had the honor to receive the most flattering personal congratulation, by telegram from the khedive himself, conferring upon me promotion, and naming me Cross Commander of the Médgidiah, in the legion of honor of the East.

Returned to Lado, the new station near Gondokoro, I commenced a second expedition to the Mahraka Niam country in January, 1875. With a column of 250 Arab soldiers, and a personal guard of my black Soudaniah, I occupied that country distant 150 miles southwest of the White Nile. The season was a propitious one, and we were no longer subject to the pitiless rain, my rations had been drawn from the abundant stores that had been received from Cairo, and my column was sufficiently strong to make me independent of the caprice and African diplomacy that had made of my former expedition simply a miracle of hardihood — almost folly. Said and Abd-el-Rahman, promoted each to sergeants, commanded my personal guard, vieing with each other in shielding me from the poisoned arrows that came to us from the secret corner in the jungle, or were found sticking in my tent in the morning.

On the first of February we broke camp, leaving the river to turn toward the "Land of Promise," the Eldorado of my Arab soldiers, whose imagination had been greatly excited by reports of the negroes who pictured the Niam-Niam women as "houris" in beauty, and the land watered by Silou, streams that ran through groves of golden fruit and whispering myrtles, a Mahommedan's paradise.

I shall pass over the incidents of the route and our march through the hostile Yanbari tribe, with the loss of one of my Soudaniah guard, treacherously wounded by a Yanbari, who died from the poisoned wounds several days after, as we bore him in an *angareb*, or litter, on the heads of his devoted comrades.

On the tenth we arrived on the banks of the Hor Yeh (possibly a branch of the Nile, recently discovered near its embouchure, running westward). The spot is a most romantic one, and seemed to realize the picture drawn by those who had told us of the land on whose

borders we now were after eleven days of painful marches. A shout of enthusiasm burst from my wearied column as we crossed a broad, sparkling stream two to three feet deep, that, with noisy murmur, dashed in foam over its rocky bed. Here was, indeed, the only approach I had ever seen to the Minnehaha, "laughing water," sung by Hiawatha.

The country is rolling and mountainous and picturesque, the soil impregnated with iron to such an extent as to render the water scarcely drinkable in many places. The Makraka Niam-Niam are a robust, warlike race, but they received us with every manifestation of friendship and joy. They are anthropophagic only by reason of the absence of all cattle. Winged ants supply, in a great measure, the absence of meat. The products of the country are yams, sugar cane and *dowale*, and further in the interior, bananas. They clothe themselves with a cloth manuactured from the bark of a tree similar to that worn by the Ugunda.

Having completed my disposition of troops with the object of the permanent establishment of the authority of the government, I caused these soldiers to marry the Niam-Niam maidens, giving to each a wife, being aided in this by the friendly sheik, who recruited them from among the divers tribes of the Niam-Niams, who flocked in great numbers to see me.

A marriage is contracted by the aspirant's presenting to the father of the maiden a huge knife, curiously wrought, and bound with skill with copper wire, in addition to which the happy "sposa" receives as her "trousseau" her sole article of dress, fine copper or brass coils that encircle the neck, arms and ankles, or rings that hang from nose, lips and ears; the head-dress being made the most important part of the toilet. Copper colored, and with exquisitely beautiful hands and feet, the Niam-Niam girl, short in statue and well rounded in limb, though not so well or so much dressed as our Parisian *à la mode*, is still quite pretty. It was here that was presented me as an "antiqua," a specimen of that pygmy race vaguely identified by Herodotus as they who waged perpetual war with the furies or the cranes, by whom they were ultimately destroyed, and revived again, long after, by the travels of Gulliver to the land of Lilliput. Truth often proves stranger than fiction. The woman, twenty-five years of age, of that remarkable race, brought by me to Cairo in the interest of ethnography, when asked if she would go with me said in Arabic, *Izakan ente mosh achkole* — "if you will not eat me."

On the night of the twenty-third of February, whilst preparing to return, having accomplished the object of my mission, a great *congo* or dance was given in my honor by the warriors that would return with me as porters of the 600 ivory tusks I had collected, a valuable cargo, since each tusk in London is worth about sixty pounds sterling in gold.

The Niam-Niam maidens were there and did honor to the occasion by brightening up their copper fastenings, and in putting on fresh fig-leaves. The loose bands that encased their arms and ankles kept perfect time in loud, clanking sound to really euphonious music made from a Sinon-like wooden horse with hollow sides, and by drum and horns. The sheik, a robust, powerfully built man, lead the German, varied by eccentric can-can evolutions, in which the round little forms of the shy Niam-Niam maiden whirled in giddy swiftness.

Several Niam-Niams had volunteered to join me, and in company with Ticki-Ticki, a Niam-Niam, a Ugunda boy and a daughter of M'Tsé, I presented them for ethnographic study in Cairo, as curious types of races never before seen.

In addition to these human types, I had with me a curious little monkey, "Abon Lauge," whose resemblance to Sothern as "Lord Dundreary" was so striking that I determined to present him to an ethnographical society as a link, perhaps, in the Darwin theory of the relation of the brute to human species. Poor Abon Lauge was accidentally drowned, however, and, to my great satisfaction, the *missing link* was thus lost.

On the morning of the seventh of March, accompanied by forty of my Soudaniahs and my Niam-Niams, I started on the return. At night, around the camp-fire, I listened, with interest, in the world that had been mine for nearly two years, to the simple tales of my soldier-companions; both language and a dreamy imagination could not fail to evoke the miraculous.

One among them, an old veteran soldier, told, in an exaggerated strain in the "historic tense," of how once he had "seen snakes;" that he had visited a country where the natives always slept with their legs crossed, or forming the letter V, to prevent the snake from swallowing them; that a failure to do so was to be swallowed and digested ere morning. Another aspirant for the crown of the marvelous delivered a story on flies, with reference to the monster flies that infest the White Nile near the mouth of the Sanbat. The eloquent story-teller said that he had seen flies in a country — geogra-

phy of which, however, was not clear — where the natives used them as horses! ending the story with an emphatic *wallai!* (by God!), in order to "hedge" the observations of doubt that generally followed too great a tension of truth, expressed by *Kaddah saket, ye achoni!* "a bare-faced lie, Oh my brothers!"

Without further delay I shall carry you back to Lado, our headquarters on the Nile, from whence, weakened in health, I bade adieu to the governor-general to return to Cairo, not only to recruit but later to command an expedition to the east coast of Africa, from which I have but just returned, and of which time forbids me to refer to-night.

I may speak briefly here, in conclusion, of what had been effected during these first expeditions, dating from February, 1874:

1. M'Tsé, king of Ugunda, had been visited; that proud African monarch made a willing vassal of his country, rich in ivory, the southern limit of Egypt.

2. The Lake Victoria Nyanza had been partially navigated.

3. The river leaving the Victoria Nyanza explored and navigated, thus establishing the connection of the two lakes, Victoria and Albert, and proving it to be navigable by steamers to Karuma falls.

4. The discovery, in latitude 1° 30′ north, of Lake Ibrahim, thus adding another basin or reservoir to the sources of the Nile; a system of basins of which the Lakes Victoria and Albert, heretofore discovered by Speke and Baker, were only known.

A telegram, received from Gordon Pasha since I have been in America, a knowledge of which would have, perhaps, caused to be still unwritten the unjust criticism of my claims by the jealous and partisan reviewer of my notes of hand on the other side of the Atlantic, says that "Sig. Piagga corroborates the discovery of that lake by Long; that the lake has fifty miles in width, and that a great branch, which goes out to the north, is either the Assua or the Sanbat." The importance of the lake is thus increased, and geography will hereafter accord me a share of the honors heretofore awarded Speke and Baker, as discoverers of the Nile sources.

The result of the expedition to the Niam-Niam country has been —

1. Communication from the Bahr el Abiad *vi et armis* by punishment given to the Yanbari, to a country rich in ivory, whose inhabitants were friendly and well-disposed.

2. Occupation of that country by the establishment of military posts, which were to serve the double purpose of acquiring ivory in

exchange for cotton cloths, and, at the same time, inculcating in the natives habits of industry, cultivation of the soil, raising of cattle, the want of which has been the chief incentive to anthropophagy; in fact, working an amelioration of the state of the negro, social, moral and mental.

3. Extended information of country and industry, and people, specimens of whom, in the interest of ethnography, were brought to Cairo.

In conclusion, I have to add here my honest impression, based upon facts and not upon fancy:

Central Africa is no paradise, but a plague-spot, and the negro, the product of the pestilential region, is a miserable wretch, devoid of all tradition, or innate idea of a Deity, that enthusiastic travelers have heretofore endowed him. This is the naked truth that I would present in contradiction to those clap-trap pæans that are sung of this benighted country, that the author may awaken interest in himself, and consequently acquire reputation at the expense of truth.

The humanitarian may pause to consider the cost at which he sends his emissaries there in the laudable effort to humanize and civilize a country where nature has placed an insuperable barrier not alone in the poisoned arrow of the savage, but in the still more deadly poisoned air that forever precludes its habitation by the white race, and thus consecrates, in advance, the devoted missionaries to misery and to death.

Egypt alone in the regions of the upper Nile, has a hardy nomadic population especially fit for the service of exploration, and exploitation of these countries, and it is to this element, in the establishment of commercial relations with savage tribes, rather than to costly expeditions, whose sacrifice, as in the case of Sir Samuel Baker, of life and money, are so greatly in disproportion to results obtained, that recourse must be had by the ruler of Egypt, by the philanthropist, and by the trader. If Providence has ordained that the regeneration of Central Africa is to be wrought by human means, it is thus and thus only it may be accomplished.

THE RIVER MACKENZIE.

By Mr. A. J. Russell.

In length of course and the extent of area it drains, it is the second river in North America, exceeded only by the Missouri-Mississippi. From its mouth, in the Arctic ocean, about latitude 69° N., longitude 135° W., to the source of the Athabasca, the most southerly-extending of its two great rival branches, about latitude 52° 20′ N., longitude 118° 25′ W., its length of course is about 2,350 miles; but to the source of its longest and largest branch, Peace river, about latitude 56° 30′ N., longitude 126° W., its length, as represented, is about 2,510 miles, and may prove greater on being surveyed. The direct length of the basin drained by the Mackenzie, from the source of the Athabasca to the sea, is 1,300 miles; its greatest breadth 1,000, its total area about 675,800 square miles. The western boundary of its basin is about 1,750 miles in length. Commencing at the source of the Athabasca, between lofty glaciers, where the highest peaks rise to 15,000 feet, far westward, in the broadest part of the Rocky mountains — whose prevailing formation is thick-bedded limestone strata (with fossils of Devonian or carboniferous age), sandy shales and slate, — the water-shed between the basins of Mackenzie and the Fraser river of British Columbia interlaces the main range (as it decreases in breadth and elevation) for 250 miles northward. Then, to include that part of the parallel valley behind the main range containing the upper courses of the Peace river and the River of the Mountains, it passes 200 miles west to the range behind, following it 600 miles north-north-west; then returns 200 miles north-east round the sources of the Yukon, or Pelly river, and, turning sharply, curves from north-north-west to north by west, and crossing the Arctic circle divides the waters of the Porcupine branch of the Yukon from those of the Peel river, and at 500 miles reaches the mouth of the Mackenzie. In the latter distance the Rocky mountains, with a declining elevation, having turned westward into Alaska, are represented here by groups of high hills, or by a high, uneven plateau whose edge, as it breaks down towards the Mackenzie, presents a

mountainous aspect. The southern water-shed of the Mackenzie is generally a straight line of 800 miles east-north-east. Commencing at the source of the Athabasca, about 4,000 feet above the sea, it traverses, for 150 miles, the Rocky mountains and the hilly, marshy, wooded country at their base; then 325 miles of a very fertile, generally wooded country, in which it falls to 1,700 feet at Meshy portage, between the Beaver river and the Athabasca waters; then further 325 miles, through a well-wooded Laurentian country, abounding exceedingly in game, deer and fish, to the height of land beyond Wollaston lake; thence the eastern water-shed of 1,600 miles passes first about 500 miles through a similar and chiefly wooded country, but of increasing sterility, varying from 1,700 to 2,000 feet in elevation; its remaining course traversing the skirt of the vast treeless "barren ground" and Arctic desert (the last 300 miles being on silurian low lands) to the mouth of the Mackenzie, where the climate is, comparatively, so much milder that the islands are wooded with spruce trees, some of which, in favorable positions on the main-land, are of a large size. Though much of the eastern side of this vast country, besides having a climate of Arctic severity, is a rugged, hilly Laurentian country, generally infertile, and much of the western side of it is occupied by the Rocky mountains and their lower spurs and outlying ridges, yet exceptionally favorable conditions of climate, soil, and mineral resources, with its great reaches of navigable waters, render the great comparatively plains-country of Laurentian, silurian and more recent formations, which extends through its entire length, having a breadth of from 400 to 300 miles, with vast deposits of coal and petroleum, more valuable and important than its northerly latitude would indicate, especially the southern part of it, which contains tracts of country more favorable for cultivation than any other in the north-western Canadian territories. The comparatively great warmth of the central basin of the Mackenzie is, no doubt, mainly due to the increasing depression northward of the great descending plain of which it forms a part, which, forming an elevation of nearly 5,000 feet at the base of the Rocky mountains near the international boundary, and nearly 4,000 where the River Athabasca leaves them, falls to 1,600 at Dunvegan on Peace river, the river being there only 910, Lake Athabasca 600, and Fort Liard (where wheat grows well), near latitude 60° N. on the River of the Mountains, only between 400 and 500 feet above the sea.

The Athabasca, or south branch of the Mackenzie, has its source

between lofty glaciers, near summits rising 15,000 feet above the sea, near the north bend of the Columbia river. The narrow valley of its main stream forms the Athabasca pass; and that of a more northerly arm is the site of the Yellow Head pass, 3,746 feet above the sea, through which the Canada Pacific railway is intended to be carried. At ninety miles, where the mountains still rise over 7,000 feet above the sea, it turns from north to north-east, and at 180 miles further (chiefly in mountain country), receives, on the south, McLeod's river, about 200 miles in length. At 108 miles further it receives, on the south, the Pembina, about 250 miles long, a large and partly navigable stream, whose banks present, besides fertile land, thick beds of lignite coal. The Athabasca here is 300 yards in width, flowing with great depth and a strong current, in a valley from one to two miles wide and 250 feet below the surrounding plain. At fifty miles further it receives, from the north-west, by a river forty miles long, the waters of Lesser Slave lake, which is 100 miles in length. Then, after elbowing south-east, it turns nearly north, and about 434 miles further delivers into Lake Athabasca the surplus water of its area of about 68,100 square miles. For the last 160 miles, from Clear Water forks to the lake, it is described as a noble, navigable stream, from a quarter to a half a mile in width, six feet deep in shallowest parts at low water, flowing smoothly through land of the richest description. The last 450 miles of its course is through a fertile country, richly wooded, with prairies interspersed, its banks presenting, in parts, beds of lignite coal and of bitumen, and springs of petroleum. From its source to Lake Athabasca, about 862 miles, its total fall is about 3,000 feet. After traversing for thirty miles the west end of Lake Athabasca, at seventeen and a half miles further, augmented by the surplus waters of the basin of that lake and its other tributaries, which is about 60,500 square miles in area, including the lake's surface of 4,200 miles, it pours into Peace river the surplus waters of about 128,600 square miles, with a course of about 902 miles to their junction.

Peace river is the main branch of the Mackenzie. The Findlay, or north branch of it, about 300 miles long, and the Parsnip, or south branch, about 200, have their courses in the great irregular valley beyond and parallel to the Rocky mountains, the north end of which sends forth the Yukon of Alaska, and the south end drains into the Fraser river of British Columbia, whose waters are divided from those of the Parsnip river by a summit elevation of only 2,200 feet

above the sea. After receiving the Parsnip at an elevation of 1,650 feet, the Peace river, varying from 150 to 300 yards in width, powerful and deep, swift in parts, but smooth and easily navigable throughout, turning more eastward, enters and traverses for thirty miles the main range of the Rocky mountains, through scenery of almost inconceivable grandeur, with steep rocky mountain-flanks or terraces, clothed with stately woods abutting the stream, rugged peaks towering 4,000 or 5,000 feet above the eye, and occasional glimpses of more lofty and remote snow-clad summits. At seventy miles from the forks, the Mountain portage, fourteen miles across, the last foothill range, the river is reached — the head of it 1,510, and the foot 1,270 feet above the sea. At 180 miles further is Fort Dunvegan; at seventy miles lower Smoke river, 170 miles long, so called from its burning coal-beds. At 150 miles further, and northward, is Fort Vermillion. At forty-five miles lower are the falls, twenty feet in hight, and twenty miles further the River Rouge, 170 miles long, enters from the south. At 190 miles more, flowing generally east-northeast, Peace river joins the outlet of Lake Athabasca, after sending a southerly arm to that lake, and assumes the name of Slave river at about 1,065 miles from its source. Peace river drains an area of about 99,600 square miles. From Mountain Portage to the falls, 445 miles, it is from 400 to 800 yards wide, and is fit for navigation, apparently by large steamers, even at low water. From the falls down to its mouth it is equally navigable, and beyond that there is continuous navigation for 230 miles through Lake Athabasca to its east end, 350 miles from Hudson's bay, forming, together, over 885 miles of navigation extending to within 350 miles of the navigable inlets of the Pacific, with the obstruction of these falls only. Between Lake Athabasca and the falls the country is low and generally wooded. Thence upwards the elevation of the adjoining plains increases gradually from 200 feet above the bed of the river to 600 feet at Dunvegan, rich prairies prevailing, combined with a large proportion of dense forests of trees of great size, chiefly on the south side, where a country of surpassing beauty and fertility, well watered and varied in surface, with immense treasures of fuel beneath, extends to the skirts of the mountains.

Owing partly to its comparative depression, and probably also to the admission of warm-air currents from the Pacific by the Peace River gap through the mountains, this part of the valley of the Mackenzie has a singularly mild climate for its latitude. Meteoro-

logical registers, and the experience of residents, prove it to have an early spring, and that its average temperature from April to October, inclusive, is very nearly that of Toronto. Prof. Macown, of Albert University, Belleville, Ontario, on botanical exploration, found *flora* indicative of climate common to Belleville, and Professor Selwyn, director of Canadian geological surveys, exhibited samples of wheat, weighing sixty-eight pounds to the bushel, raised at Fort Chipeweyan, at the north-west end of Lake Athabasca, sown May 21st and reaped August 16th, 1875, that yielded sixty bushels to the acre.

About 120,000 square miles of the basin of the Mackenzie south of latitude 60° N., may be considered suitable, generally, for the successful cultivation of wheat; much of it is exceedingly fertile. Lake Athabasca, for 200 miles of its length, and its eastern tributaries lie on the broad belt of rugged Laurentian highlands. At its west end its waters unite with those of the Athabasca and Peace rivers, forming, together, the outflow of an area of about 228,200 square miles, and flow northward 231 miles to Slave lake, under the name of Slave river, through the irregular fracture between the rugged Laurentian belt and the silurian and Devonian formations of the great plain west of it. Slave river is, for eighty miles, navigable; then twenty-four miles are obstructed by rapids, requiring seven portages, amounting, together, to over two miles in length, being the only carrying places encountered by Sir Alexender Mackenzie either on descending or ascending the 1,649 miles of his river, between Clear Water forks of the Athabasca, latitude 56° 42′ N., longitude 111° 15′ W., and the Arctic ocean. Slave lake is 320 miles long by sixty miles in greatest width; its area is over 11,300 square miles. Near its middle, where Slave river enters it, the division line between the geological formations mentioned crosses it; turning north-eastward the highlands rise 1,100 to 1,400 feet above the lake, in parts columnar and precipitous, presenting scenes of singular wildness and grandeur. Besides Slave river, Slave lake receives from the south-south-west, near its western end, Hay river, 410 miles long, through prairie plains from east-south-east; the Thetinah, 470 miles, through Laurentian highlands; and at its eastern end the waters of a chain of lakes extending 320 miles, besides lesser tributaries. Augmented by the waters of the basin of Slave lake, 135,000 square miles in area, the Mackenzie leaves it with a strong and occasionally rapid current from one-half a mile to two miles wide, and from four to twelve fathoms deep. At 206 miles the Stony rapid, nine miles long, is reached (from which to the Arctic